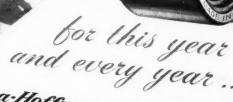
# MODERN Shop

TECHNOLOGY DEPARTMENT

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JANUARY, 1949

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LANDEX HEAD

LANDMACO THREADING MACHINES



CUTTING

# BETTER THREADS LANDIS METHODS

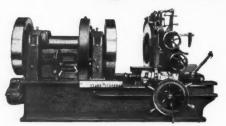
· The LANDIS LINE, offering equipment designed to perform many types of threading operations, has a worldwide reputation for precision accuracy and high-speed production.



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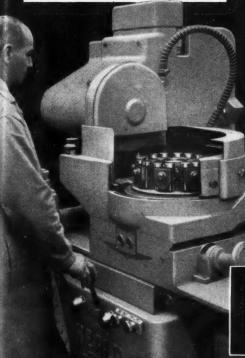
CENTERLESS THREAD GRINDER



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Doing a better job, faster, with less equipment is industry's answer to the increasing problem of producing goods at a profit. Here's how Heald engineering accomplished this for a compressor manufacturer-with a Model 261 Rotary Surface Grinder. This new machine grinds compressor rotors, 16 at a time, to a .000030 tolerance for flatness: .0006 for thickness: and .00015 for squareness with the shaft. Rapid automatic cycle, multiple station fixture, and complete ease of operation, materially aided in speeding up production. And this one Heald machine now does the work of two machines previously used for the same operations.

Why not see what a new Heald machine can do for your grinding operations? Your nearest Heald representative - or our engineers here at Worcester - will be glad to help you.

Heald Model 261 Column Type Surface Grinder.



Line drawing of compressor rotor, showing the surface precision ground.

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EASIER...

FASTER ...

MORE ...

WHEEL DRESSINGS

at lower cost!



A FEATURE

OF THE

#### HANSON-WHITNEY TRREAT GRINDER

This page has been arranged for but one purpose . . . to induce you to see the new Hanson-Whitney semi-automatic Thread Grinder at work. It is impossible, in restricted space, to explain the importance of this engineering achievement . . . to provide the close-up photographs that bring out the many design innovations . . . nor can we show you the accuracy, the speed, the quality of production.

But we can arrange an appointment that we believe will interest anyone who needs a better, faster, method for grinding external threads from the solid on a production basis. You will see a Master Roll (A) that re-trues the Grinding Wheel for regrinding the Crusher Roll(B) in position, whenever its pattern has been worn by repeated crushing of the wheel.

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MODERN MACHINE SHOP

January, 1949

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at the
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FINGER!

No manual gear shifting.

Just touch this knob for quick high-low or low-high spindle speed shifts.

A great timesaver—

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ed changes (6-1 ratio) are made by hylically operated clutches This standard ure on all Gisholt Turret Lathes is a big antage in drilling-tapping, boring-reamand turning-threading operations.

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Madison 10, Wisconsin

THE GISHOLT ROUND TABLE

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accurately and quickly copy anything put under the tracing finger. Look at the example shown here. Except for tone, master and copy look exactly alike. Just think what this means in reducing the cost of hand tooling. We can show you many comparable examples of work.

yours faithfully

CINCINNATI 8" x 18" TOOL AND DIE MILLER





Right: Master

Left: Die, copy milled on CINCINNATI 8" x 18" Tool and Die Miller. The die has not been hand tooled nor the photograph retouched. Time, 7 hours.



#### THE CINCINNATI MILLING MACHINE CO.

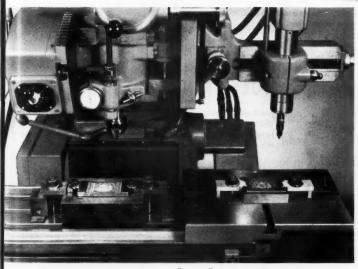
CINCINNATI 9, OHIO, U.S.A.

MILLING MACHINES • BROACHING MACHINES • CUTTER SHARPENING MACHINES FLAME HARDENING MACHINES • OPTICAL PROJECTION PROFILE GRINDERS • CUTTING FLUID

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CINCINNATI 8" x 18" Tool and Die Miller offers other advantages: The spindle head swivels in two planes for universal milling; turret construction permits quick setup of slotting head. Write for catalog M-1620.



Above: Setup on CINCINNATI  $8'' \times 18''$  Tool and Die Miller for copy milling the die shown at the left.

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A self contained motor driven unit for use on any milling machine, horizontal boring mill or work bench for rotary milling or indexing. Eliminates set-up time. No installation—just plug into nearest electric outlet. Geared-down motor gives plenty of power. 18 Feed changes, 1½" to 54" or 3" to 108" per minute. May also be used as automatic revolving fixture.





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Accurately and quickly finishes holes and bores up to 6" diameter in hardened parts. Simplifies handling work too large to swing in standard machines. Special adaptors permit easy installation on any milling machine.

Both Will Increase Output And Lower Costs—Write NOW!

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10

3920 WEST PINE BLVD. ST. LOUIS 8, MISSOURI W.B.KNIGHT MACHINERY CO. 3920 WEST PINE BLVD. • ST. LOUIS 8, MISSOURI

Send information and prices immediately on

☐ 20" Rotary Table ☐ Hole Grinding Attachment

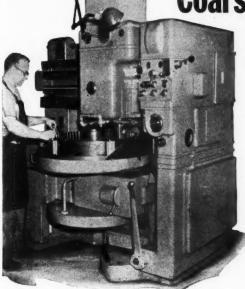
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**Coarse-pitch Gears** 



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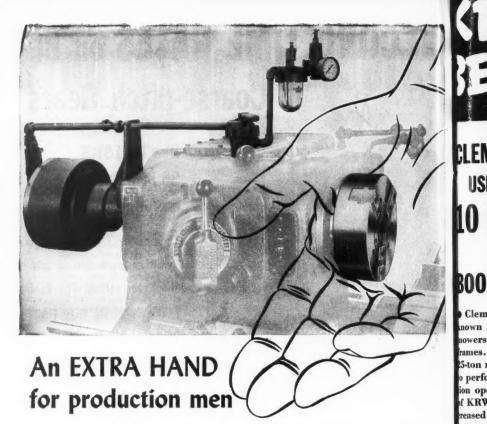
The Fellows Gear Shaper Co., Head Office and Export Dept., Springfield, Vermont. Branch Offices: 616 Fisher Building, Detroit 2; 640 West Town Office Building, Chicago 12; 7706 Empire State Building, New York L

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1. They increase production by reducing the chucking time.

2. They help eliminate operator fatigue.

Production men also appreciate this extra hand—that increases output—that reduces cost.

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Complete details on Skinner Power Chucks, rotating and nonrotating air cylinders, valves, filters and all other Skinner chucking and vise equipment are contained in Catalog No. 60, Write for your free copy today.

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HAND & POWER OPERATED MACHINE CHUCKS - AIR CHUCK EQUIPMENT - FACE PLATE JAWS - MACHINE VISES

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and Between
the Sensitive and the Heavy Duty Upright

FOSDICK
NEW 21" BM
UPRIGHT DRILL

 Here's a sturdy machine built along the same lines as the Upright but designed to handle work between the capacities of the Sensitive and the Heavy Duty Upright Drill.

Nine or eighteen speeds and four feeds are available through the gear box. The power feed is operated from a positive clutch which is engaged by pulling forward on a four spoke lever. Feed clutch engages when drill contacts the work. An over-take feature is combined with power feed so that drill can be advanced without disengaging the feed dial. A lock-out prevents power feed from engaging when hand feed is being used.

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With switch knob in tapping position, a downward motion of the four spoke lever causes tap to run in correct direction, an upward motion of the spoke lever reverses the motor and backs out the tap. With switch knob in drilling position an upward motion of the spoke wheel will not reverse the drill and destroy cutting edge.

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Jarvis Rotary Files are ground-from-thesolid to give high speed, precise and economical service. These Jarvis Tungsten carbide files, as well as high speed rotary files are available in over a hundred different shapes and sizes to meet every material requirement. New manufacturing techniques followed in forming blanks and grinding flutes assure quality and performance and keep unit cost at a minimum. Additional economy is provided by Jarvis'

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Mill. Four flutes. For general end milling.

No. 1887 - Hi-Helix Ball End Mill. Two flutes. For milling fillets, round bottom holes, radius-bottom slots, by regular length mills.

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No. 1895 - Small Diameter Hi-Helix Double End Mill. Four flutes.

No. 1897 - Hi-Helix Single End Mill. For general end milling.

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... because

## They Can't Clog the Flutes of MORSE Hi-Helix END MILLS

Yes, chips like these have a definite cash value to endmill users. For the shear-cutting action of the exclusive Morse Hi-Helix design curls up and rolls out the chips ... easily, evenly ... without ever clogging the flutes. So mill-life is longer. And cutting action is smoother, swifter, chatter-free . . . even on the toughest jobs.

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And if your problems require Morse Engineering Service, remember that this service is always yours for the asking.

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# 3 Hole Grinding Problems

CAN YOU ESTIMATE THE TIME?



#### TWO-STATION DIE BLOCK

All holes ground to exact size and location. Blank hole and center piercing hole ground with one half degree included taper. Little clearance permissible between punch and die. 2% hrs. on the Moore Jig Grinder.







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Gear A: Eight holes on circle ground to size and location within ±.003"...Gears B, C, D, E: Radii at ends of elongated pockets ground to size and location within ±.0003"...Gears B, C: Radii ground to shoulder near

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MOORE SPECIAL TOOL CO., INC. - 730 UNION AYENUE, BRIDGEPORT 7, CONN.



TO YOUR TOOLROOM

JIG BORERS JIG GRINDERS I

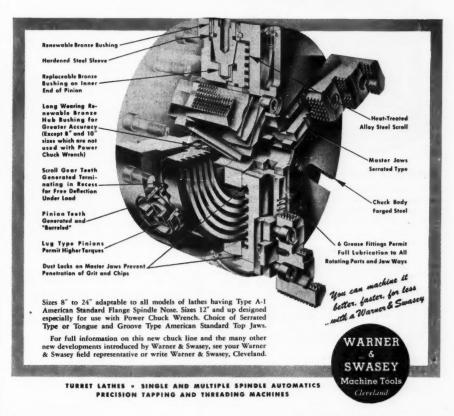
HOLE LOCATION ACCESSORIES PANTO-CRUSH WHEEL DRESSERS

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Better fits from closer tolerances. Complete ubrication to all rotating parts and jaw ways. Pinions and scroll turn on renewable bronze bushings. Serrated jaws permit easier setups.



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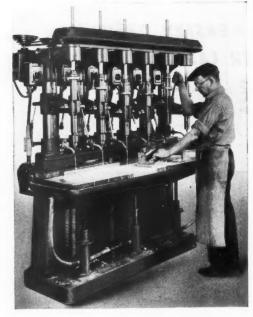
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Gears

# No "Drilling Bottleneck"



#### Available With No. 16 Drills-

Special equipment to suit your particular requirements—such as coolant system, low speed attachment and tapping attachment—is available with No. 16 Drills. Write us about your drilling problem!

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You can keep drilling costs rockbottom and production flowing smoothly with this six-spindle No. 16—or one of the other "sixteens" that fit your operation! They're rugged from spindle-tip to base, ready for accurate, continuous production. Single and multispindle models, for hand or power feed in 8", 12" or 15" overhang, floor or bench types. Paying for themselves in "more holes per hour"!

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for complete details on these easy-handling drills.





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SHEARING CUTTING
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Your telephone leads straight to a complete, highly diversified stockpile of steel bars and shafting in your industrial area . . . the warehouse of your Union Drawn Distributor.

Better still, this stockpile is so geared to the needs of the shops and plants in the area that your order—whether for a single bar or a truckload—usually can be filled immediately and delivered to your receiving dock in a matter of minutes. And the smallest order receives the same attention and speed of handling as the largest.

Why freeze your working capital in a stockpile of your own, when this service is available? Make a note of your Union Drawn Distributor's telephone number—call him today and ask for a copy of his stock list.



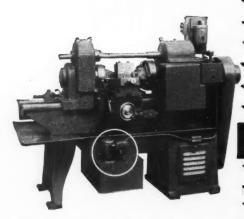


Photo Courtesy The R. K. LeBlond Machine Tool Co. showing a LeBlond No. 1 Crankshaft Lathe with 1/10 HP Model 1-P3 Gusher Coolant Pump.



- COOLANT
- PUMP
- SPECIFY

## RUTHMAN COOLANT



Comparison will show you that Improved Ruthman Gusher Coolant Pumps have many points of superiority, such as

- 1—Oversized Pre-lubricated ball bearings requiring no further lubrication.
- Fewer moving parts—less wear.

  One-piece dynamically balanced shaft, reduces vibra-
- No metal to metal contacts in Pump Housings.

  -Split second coolant flow from a trickle to full volume.

  -New Drip Proof Motor end-bell, with larger built-in conduit box simplifies wiring.

You are assured of better Coolant performance when you use Ruthman Gusher Coolant Pumps on your machines.

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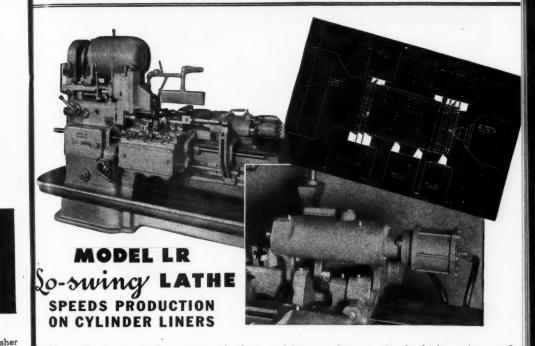
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## MACHINE OF THE MONTH

PREPARED BY THE SENECA FALLS MACHINE CO. "THE So-owing PEOPLE" SENECA FALLS, NEW YORK



Problem: To automatically turn outside diamters, face and groove cast iron Cylinder Liners of various types with Carbide Tools.

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folution: Model LR Lo-swing Automatic Lathe was selected for this job because of its demontrated fine performance with carbide tools, and is case of setting-up due to its Simplified Change-byer Mechanism. A Relieving Tailstock which minimizes tailstock spindle overhang, and which acilitates loading and unloading, was incororated.

he cast iron cylinder liners are delivered to the athe with the bore machined to size and the arge end faced. They are held and driven with a air-operated, expanding collet arbor which extacts the full length of the piece. This large area

driving surface permits the high cutting speeds and coarse carriage feeds required for fast production. Loading of the parts is simplified with the Relieving Type Tailstock, shown in the close-up illustration. Since the driving arbor is bolted to the spindle nose, the operator is relieved of handling heavy stub arbors generally used when work is held between centers. The outside diameters and the short taper on the tailstock end of the liners are turned with six tools mounted on the front slides; all facing and grooving operations are accomplished with tools mounted on the rear slide. The entire operation is automatic—the operator simply loads and unloads the parts and pushes the starting button.

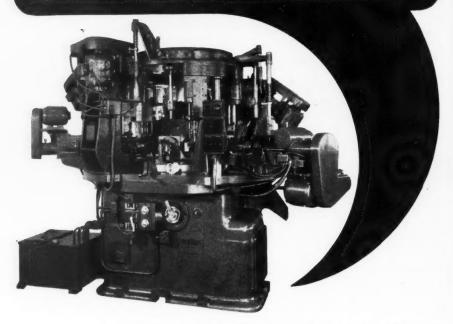
Seneca Falls engineers are at your disposal to assist you with your turning problems.

SENECA FALLS MACHINE CO., SENECA FALLS, N. Y.

PRODUCTION COSTS ARE LOWER WITH S.

Here's automatic production at its best

### MORRIS MOR-SPEED Production Machine



On this machine the operator merely loads and unloads the work while machine is operating on the piece. All machine functions including the indexing are automatic.

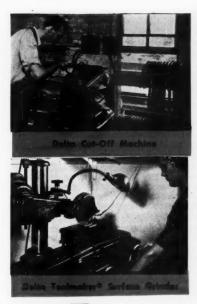
The machine drills—taps—spotfaces and reams carburetor main bodies on a mass production basis for a prominent automobile concern.

The machine of vertical design has 12 automatic indexing four position fixtures,

20 drilling spindles, 7 facing spindles, 15 tapping spindles, 1 brush spindle and 4 reaming spindles and turns out a completed piece at every index of the turret.

Here is another typical instance of where Morris developed the machine to meet specific job conditions. If you are interested in the high production of work requiring drilling, reaming, tapping, facing and similar operations consult Morris—they have the experience, engineering ability and facilities to help you.







### **Easy to Operate**

— that's one reason why Delta®-Milwaukee Machine Tools pay off for this bike builder



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Women machine-operators easily grind their own cutters, with the Delta Toolmaker Surface Grinder at the Weller

Products Co., Milwaukee, Wis.
This company makes a child's tricycle known as "Kar-Bike." It is an all-steel, scientifically-designed bike, precision-made with Delta tools and special cutters.

In addition to showing the easily-operated surface grinder, the illustrations here picture the Delta Cut-Off Machine cutting frame tubing for "Kar-Bike"... and a Delta Drill Press tapping small steering-gear parts.

Many another plant has learned that the operating simplicity of Delta-Milwaukee Machine Tools helps to increase production — with safety. Your Delta distributor can suggest ways that low-cost Delta tools can save you time and money. Ask him

about buying on easy time payments. Look for his name under "Tools" in the classified section of your telephone directory. Send coupon for descriptive literature, "Trade Mark Reg. U.S. Pat Or.

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Regardless what type hack saw machines and matal-cutting band saw machines you use, MARVEL BLADES will improve performance. There are sound reasons why this is true; practical reasons that are easily understood and demonstrated.

'MARVEL High-Speed-Edge Hack Saw Blades, with a genuine high-speed-steel cutting edge integrally welded to a tough alloy steel body, are both fastcutting and positively unbreakable. This construction permits greatly increased speeds and feeds and tautor blade tensioning. Still, they last much longer than ordinary blades.

MARVEL High-Speed-Edge Hole Saws, with this same unbreakable construction and heavy-duty arbors, have the extra strength required for drill press and lathe use...rapidly saw holes from % to 4½ diameter thru steel of up to 1½ thickness.

MARVEL Band Saws are of selected quality. They come ready for use, pre-welded to size for each make and model saw. Individually boxed, they are protected against kinking, rusting or damage to teeth!

Write for Blade Catalog Sheet.

ARMSTRONG-BLUM MFG. CO.

Jan

# For Flat Broach SHARPENING Use the OLIVER ACE

For those who use flat broaches, Oliver supplies a special attachment for the ACE Cutter Grinder, a fixture which grinds flat broaches in the throat, maintaining the original spacing of the teeth — or grinds them on the clearance surface of the teeth, maintaining accurately the variation in height between successive teeth.

Write today for Descriptive Literature.

Today, in many hundreds of plants, the Oliver ACE is a highly valued piece of equipment, used for sharpening a wide variety of tools.

NO STOOP-NO SQUAT-NO SQUINT!

... A Pleasure

In addition to the fixture described above Oliver supplies ACE owners with attachments for radius work for tap grinding, and with a variety of vises and tool holders for special grinding jobs.

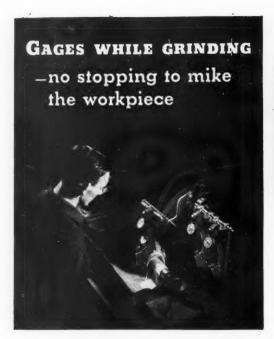


OLIVER Instrument co.

1430 E. Maumee St. Adrian, Michigan

OF ADRIANCE OF ADR

AUTOMATIC DRILL GRINDERS
TOOL & CUTTER GRINDERS—DRILL
FOINT THINNERS—TEMPLATE
TOOL GRINDERS—FACE MILL
GRINDERS—DIEMAKING MACHINES



#### Increases production as much as 100%



Prevents oversize regrinds and undersize rejects

WHEN your grinding machine is never stopped to check the size of the work in process, your hourly output increases... the cost per piece decreases. That happens when you install a Federal-Arnold Continuous Grinding Gage.

This gage controls dimensions at the machine while the work is being ground. You put the gage on the rotating workpiece and leave it there; you do not hold it on the work; there is no stopping to mike or gage for size.

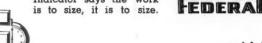
The operator requires no unusual skill or training; he merely watches the Dial Indicator until the piece is finished. When the Dial Indicator says the work

Attach an Arnold Gage to a grinder and you save many a dollar otherwise lost in scrap. Even on short runs, this saving in scrap and the increase in output pay for your Arnold Gage in a very short while.

This instrument is easily installed; is sturdily constructed to assure long life and continued accuracy. The contact points are made of tungsten carbide.

You can use Arnold Gages to check straight, tapered or splined diameters; widths between or over shoulders;

combined diameter and width. Write us for illustrated Bulletin No. 15.



FEDERAL PRODUCTS CORPORATION

1144 Eddy St., Providence 1, R. I.

• Dimensional Dial Indicators and Indicating Gages—mechanical, electronic, air, multi-dimensional . Automatic Sorting . Dimensional Machine Control . Combinations of these methods . For the Mechanical. Textile, Rubber, Paper and all industries requiring dimensional accuracy.

# A Thumbnail description



SOLD THROUGH DISTRIBUTORS

AMERICAN SAW & MFG. CO. SPRINGFIELD, MASS. HACK SAWS · BAND SAWS · GROUND FLAT STOCK · TOOL BITS.

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before resharpening

STYLE BL

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SOLID BORING TOOLS

MANUFACTURERS OF SUPERIOR CEMENTED CARBIDES AND CUTTING TOOLS THAT INCREASE PRODUCTION

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#### PLANERS BORING MILLS SHAPERS

# STANDARD

Type PAV Vertical Spindle Grinder; Telescopic Wheel Guard; "Air-Rester" Dust Collecting Unit!

METHOD: Simply remove clapper box "CB" and mount grinder.

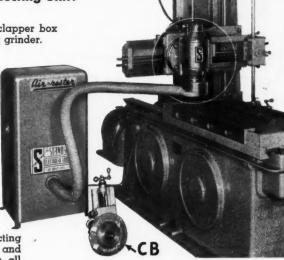
Investigate this STAND-ARD time and money saving combination today!

TYPE PAV from ½ H.P. to 15 H.P. Speeds from 3600 to 1200 R.P.M. Equipped with vertical or horizontal feed, or both feeds. Micrometer feeds. Hollow spindle for wet grinding. For cup wheel, plate mounted cylindrical wheel, or straight grinding wheel.

"AIR-RESTER" dust collecting equipment. (Also illustrated and available separately.) For all kinds of dust, grit, etc. Three sizes.

WRITE FOR CATALOG 44 TODAY!

# QUICKLY CONVERTED TO DUST-FREE GRIT-FREE GRINDERS



36" Openside Shaper converted into a grinder with STANDARD TYPE PAV Vertical Spindle Grinder, telescopic wheel guard and "Air-Rester" dust collector.

The STANDARD ELECTRICAL TOOL Co.

2487 RIVER ROAD

**CINCINNATI 4, OHIO** 

# DISSTON METAL CUITING BAND SAWS

In Types, Patterns, Tempers for All Metals, All Speeds

# HARDENED THROUGHOUT



Regular type for normal high speed cutting.



Reinforced type for heavy-duty, high speed cutting.

For high speed cutting of non-ferrous metals, plastics and many other materials. Made with Regular and Reinforced teeth in all standard dimensions. Also recommended for friction cutting of ferrous metals at speeds of not less than 12,000 f.p.m.

## HARD EDGE, FLEXIBLE BACK



Buttress tooth pattern for speeds of 3,000 f.p.m. and over.



Regular type for normal low speed cutting.

Hardened on tooth edge only. Teeth are milled (not punched) and accurately set by machine. Made with Regular type teeth for general metal cutting at low speeds; and with Buttress type teeth for machines operating at speeds of 3,000 or more f.p.m. . . . specially recommended for magnesium and aluminum alloys.

#### NEW! DISSTON Safety Reel



An improved design with added features. Supplied with all sizes of Hard Edge Flexible Back blades from 1/2" to 1/2" in coils of 100 feet.

#### For Better Metal-Cutting Tools Ask for Disston Files . . . Hack

Saw Blades . . . Circular Saws . . Carboloy Fitted Circular Saws

Order from your DISSTON Distributor or write direct for further particulars.

HENRY DISSTON & SONS, INC., 121 Tacony, Philadelphia 35, Pa., U. S. A.
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ESTABLISHED 1840

## WHEN YOU WANT MOVE TOOL LIFE

#### TRY BARBER-COLMAN CARBIDE TIPPED MILLING CUTTERS

This job was sow and costly because of low tool life and high cutter breakage. Three intermittent bosses on cast-iron brackets required the removal of 1½" stock. Hard spots and abrasive action of the material combined to shorten tool life by nicking and chipping the cutting edges.

After careful analysis of all factors, Barber-Colman Cutter Engineers recommended the use of carbide tipped shell end mills, with fewer teeth and slight-spiral gashes. Today, experience tested B-C tip mountings and heat-treated high speed steel bodies are suc-

Cutters — B-C Carbide Tipped Shell End Mills, 2¼' x 1¼' x 1¼', slight spiral gashes.

C-T Cutter

240 S.F.M.

90 in 10 hrs.

200 pcs. per

Feed ...... HSS Cutter

Floor-to-floor..... 30-40 in 10 hrs

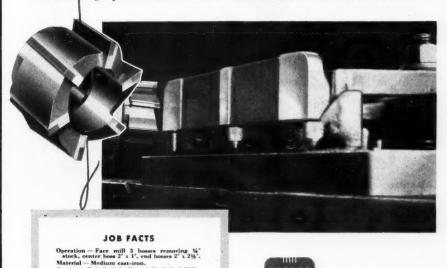
Speed...... 40 S.F.M.

Tool Life...... 50 pcs. per sharpening cessfully withstanding the shock of the hard spots, and tool life and production are increased approximately 400%.

If your job conditions are suited to the use of carbides, consult a Barber-Colman representative on your next production problem. Experience the satisfaction that this manufacturer had in improving operation and increasing production.

#### Barber-Colman Company

GENERAL OFFICES AND PLANT 182 LOOMIS ST., ROCKFORD, ILLINOIS, U.S.A.



DEMAND Modern CUTTING TOOLS

MODERN MACHINES

### ROBERTSON GRINDING





#### WHEELS

## enjoy long life

Why does a Robertson outlast a conventional wheel? Because it doesn't "load." Its revolutionary open structure leaves plenty of space for chip clearance, and the wheel retains its free-cutting qualities much longer than conventional wheels. You don't wear a Robertson out dressing it. A Robertson is *not* simply a conventional wheel of extreme hardness. It is radically different . . . and better.

Here's one example of Robertson's ability to do its work with the minimum of wear:

Using a Plain Cylindrical Grinding Machine to remove .015" to .020" stock from 1040 steel ground to a tolerance of plus .001" minus .000", a manufacturer of motor shafts was able to finish only 10 pieces per wheel-dressing. Production was being slowed by the frequent work-stoppage to dress the wheels. When he substituted an RA46 MV Robertson Wheel on the same job—and with no change in grinding method—production immediately increased from 10 to 30 shafts per wheel-dressing. Further results: Longer wheel life, decreased production costs.

Let us show you how Robertson Grinding Wheels can reduce your wheel costs, help increase production and give you a substantial bonus in decreased power consumption. Write on your business letterhead for a demonstration. Or blueprint your grinding problem and let us recommend a wheel for that specific job.

### ROBERTSON MANUFACTURING COMPANY TRENTON 5, NEW JERSEY

Resin-Bonded and Vitrified-Bonded Grinding Wheels • Mounted Wheels • Segments



# Quicker Way of Drilling Cross Holes In Door Handles

WITH this set-up of four Govro-Nelson Automatic Drilling Units 4 cross-holes can be drilled simultaneously in automobile door handles and window regulators, deburring the ID with a broach, and automatically ejecting the part.

The result of this superior drilling method is an output of 1000 to 1400 pieces per hour, depending upon operator efficiency—four times the production rate per man by former methods.

If you have similar operations, send samples and part prints and we shall be pleased to recommend the proper Automatic Units or quote on a complete set-up. Literature sent upon request.

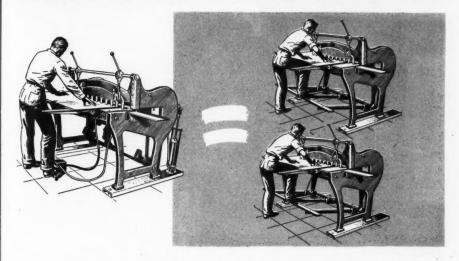


#### GOVRO-NELSON CO.

Machinists of Precision Parts for 25 Years 1933 Antoinette, Detroit 8, Mich.

Automatic DRILLING UNIT

## Make ONE machine do the work of TWO



### <u>Airpower</u> your manually operated shears, power presses and other machines with SCHRADER Pneumatic Machine Controls

Yes, it's a fact that with Schrader Controls operators work more efficiently, with greater safety, and less fatigue.

Take a shear, for example. Ordinarily foot operation is awkward and tiring. And when the strips to be sheared are long, two men are needed to position the material and operate the shear.

What a difference with Schrader Pneumatic Controls! One man does the whole job easily ... at the mere touch of a foot pedal. Moreover, the

foot pedal can be shifted at will to any position desirable for the comfort and convenience of the operator. With Schrader Controls the same machine will do more work per hour... and will also shear heavier gauge metals.

Write today for the NEW folder describing Schrader Pneumatic Controls (use coupon below) . . . And remember, our engineers can devise Schrader Controls for almost any machine operation in your plant.



1949



#### The Monarch Model EE 10" Sensitive Precision Toolmaker's Lathe

A sensation when it was first introduced in 1938, the Monarch Model EE Toolmaker's Lathe has recently undergone additional design refinements—to give you accuracy, sensitivity and ease of operation unsurpassed by any lathe, at any price. Outstanding is its wide range of infinitely variable spindle speeds.

Accuracy is in-built—and basic, starting with the famous Flame-Hardening process for bedways. To this is added induction hardening of many critical parts—and myriad other design and production refinements, all calculated to give you the most in metal turning. Complete details are contained in Bulletin 302. Write for your copy.



THE MONARCH MACHINE TOOL CO., Sidney, Ohio

FOR A GOOD TURN FASTER - TURN TO MONARCH

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# You can't know about Master Collet Performance until you use HARDINGE Style "S" Collets



#### Here is the BIG difference -

Hardinge Style "S" has an independent dovetail lock clamp that is secured to the pad only. Therefore, there is no strain between the pad and collet when loading stock or from thrust from end working tools. All end thrust is absorbed by the pad shoulders in the recess of the collet as it should be absorbed.

This unique feature does away with threaded holes. The collet angle and pad gripping sur-

face are the same as a solid collet to give solid collet performance.

"Now I know why Hardinge Style
"S" Sure-Grip Master Collets and
Pads will overcome the objectionable working loose of pads. Now
I can benefit by low pad prices, plus the advantage of changing pads without removing
the master collets from the automatics."

Ask for our free bulletin "S" and specify Sure-Grip Master Collets and Pads.

#### HARDINGE BROTHERS, INC., ELMIRA, N. Y.

PERFORMANCE HAS ESTABLISHED LEADERSHIP FOR HARDINGE

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THE "FEEL" OF PERFECTION... is immediately apparent the first time a machinist puts the tool to the work in an AXELSON lathe. Velvet-smooth control action... more positive flow of power at the cutting tool without vibration or chatter.

PRACTICAL VERSATILITY... permits a wide vatiety of operations with all types of tools, on any kind of stock...two-speed tailstock...wide range of feeds and speeds instantly available. THE TOOL CARRIES THROUGH... with precision accuracy from the beginning to the end of each cut. Massive construction throughout to maintain absolute alignment... perfectly mated bearing surfaces on slides and ways.

BUILT-IN SAFETY... protects operator from injuries, tools from breakage, and work from reject bin. All controls within easy sight and reach of operator.



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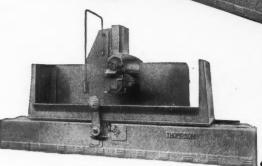
# AXELSON Lathes

DEPENDABLE FOR A THIRD OF A CENTURY

AXELSON Manufacturing Co., Los Angeles 11 • New York 7 • St. Louis 16

# BIGTHOMPSONS

for BIG SAVINGS in Surface Grinding year after year!



EXAMPLE NO. 1

Above—Thompson Heavy Duty Type CX 30" x 48" x 196" Hydraulic Way Grinding Machine with auxiliary vertical spin-dle for grinding safety gib, clamp surfaces and rack seats on machine bed. Working capacity of horizontal spindle, 240". Bed length 46 feet.

EXAMPLE NO. 2

At left—Thompson Heavy Duty Type CX 36" x 48" x 120" Hydraulic Surface Grinder. Equipped with super precision spindle powered with 40 H.P. motor.

The only manufacturer of a complete range of heavy duty and light duty surface and contour grinders for industry!

Write for new general catalog



Thompson SURFACE

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Where success depends on accuracy...



Production men turn to Jacobs Chucks as naturally as the die maker to his instruments when *precision* is prerequisite to success. Their powerful grip holds tools tight and true...their rugged construction maintains accuracy over a long service life. The

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Jacobs Plain Bearing Chuck is the world-wide favorite as original equipment with manufacturers of portable tools and drilling machinery. Stocked by your Industrial Supply Distributor. The Jacobs Manufacturing Company, Hartford 2, Connecticut.

If it's a JACOBS, it holds



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### FOR DE-STA-CO PORTABLE TOGGLE CLAMPS

This progressive trailer coach manufacturer designed hisframe of square tubing for line assembly by welding. It takes pressure to draw formed tubing together for welding - it takes fast action to keep handling costs low - it takes De-Sta-Co Portable Plier clamps to meet all the qualifications this rapid production demands. You, too, can rely on their quick, positive toggle lock and release, their ample clamping pressure and easy adjustment to varying thicknesses and their wide, deep jaws for your bulky, awkward jobs.

These NEW De-Sta-Co Portable Clamps are machined forgings with deep-section jaws and grips. Bearing pins are long-wearing stainless steel. Models 468 and 474 are available with spring compensating or screw adjustment.

Write for folder describing Portable Toggle Clamps or our general catalog No. 47.

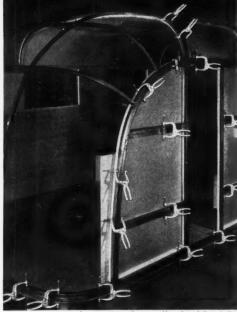


Photo Courtesy Vagabond Coach Co.

#### Assembly of

Sheet metal ducts, cabinets, furnaces...

Portable Clamp Uses:

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- Truck and auto bodies . . .

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Stamp

In the

 Wood and plastic laminations . . .

For drilling, welding, riveting, cementing . . .







#### DETROIT STAMPING COMPANY

349 Midland Ave., Detroit 3, Mich.

MODERN MACHINE SHOP

January, 1949

·7200 stainless steel stampings per hour-

·tolerances held within



0.002"

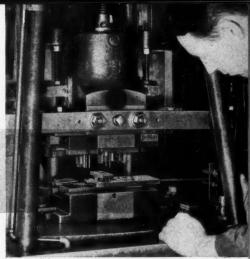
### DANLY STANDARD PRECISION DIE SET

Sustained operating precision of die set reduces die wear...produces 200,000 stampings per grind

Inherent accuracy in Danly Die Sets permits taking full advantage of the die maker's precision under actual press operating conditions. As a result, close tolerances may be held and tool life is substantially increased.

In the stamping operation shown, stainless steel parts for electrical instruments are pierced, formed and blanked in an intricate progressive die. Tolerances are extremely close, and finished parts must pass rigid gage inspection.

Stampings are produced at a rate of 120 per minute. At







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DANLY ENGINEERING SERVICE-Use Danly Die Sets to insure the same close precision, high production and long die life on all of your press work. Consult our Engineering Dept. for helpful recommendations on die sets—large or small, standard or special—for any type of press operation. (No obligation.)

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- # Long Island City 1, 47-28 37th St.
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MECHANICAL PRESSES AND PRESS EQUIPMENT



No. 12—12 Ton Press

★ 6 MODELS FROM 5 TO 30 TON CAPACITY

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BLANKING PUNCHING FORMING DRAWING STAMPING

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# PRESS-RITE OPEN BACK-INCLINABLE PUNCH PRESSES

# And Get GREATER SAFETY At No Extra Cost

Save time by making your set-ups faster and easier with the larger die space and shut height of PRESS-RITE Presses.

Increase production and lower unit costs by improved operator efficiency brought about by built-in safety-features which include:

- ★ Exclusive Single Stroke Safety Non-Repeat Mechanism
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See the hardened and precisionground steel bed with double-bevel ways for alignment. In combination with the wide top surface they provide maximum bearing area for slide rest shoe and tailstock. The self-centering action of the doublebevel ways safeguards tailstock from wearing away from cutting tool out of alignment.

Double-bevel ways assure against the inherent weakness of any type of bed which depends upon front bearing only for alignment. In such construction wear is lateral against a narrow bearing area and away from cutting tool which makes for taper turning between centers. This out of alignment also produces off-center (oversize) drilling and reaming

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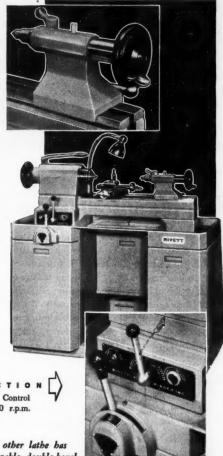
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On double-bevel ways the tailstock may be operated in conventional fashion, slid at will along the bedways and locked in desired position by slight finger touch on the eccentric binder. Binding force is self-centering and downward against a large bearing area.



SPINDLE SPEED SELECTION

Correct spindle speed for any operation. Control lever affords any speed from 90 to 3700 r.p.m. Selected speed shows on dial.

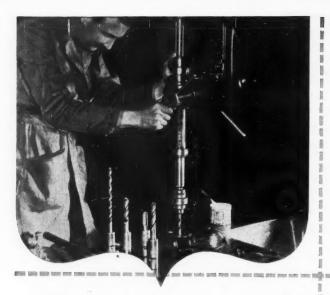
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No other lathe has comparable double-bevel "steelway" features.

RIVETT

RIVETT LATHE & GRINDER, INC.

BRIGHTON BOSTON MASSACHUSETTS U. S. A.



#### ideal for miscellaneous holes

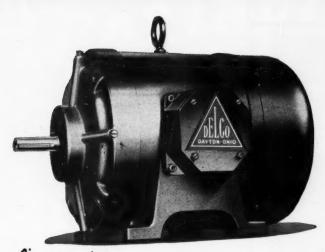
● For those miscellaneous drilled, reamed, counterbored or tapped holes the Footburt-Hammond Radial is the handiest machine in your shop. With its unique bracket type design the spindle quickly swings from hole to hole over a wide area. Six instantly changed speeds are available and the convenient electrical reverse really speeds up tapping work. Write for full information.

THE FOOTE-BURT COMPANY • Cleveland 8, Ohio
Detroit Office: General Motors Building









### NO down-time WHEN MOTORS ARE ON THE JOB!

Down-time for repairs costs money! For motors that won't let you down . . . always deliver under the most adverse conditions . . . specify Delco motors. They combine simplicity of design with rugged construction . . . require a minimum of maintenance.

Delco's special features assure continuous, trouble-free power: Locked bearings, Delcote coil insulation, corrosive-resistant cast iron frame. positive lubrication, dynamically balanced rotor and shaft assembly. water-tight conduit box-features

that mean you can depend on Delco for dependable power.

Eliminate down-time with Delco motors! There is a Delco motor built to fit your needs exactly.

Delco totally enclosed fan-cooled motors are produced in sizes ranging from fractional ratings to 75 h.p. (Continuous duty, constant speed, 60 cycle, polyphase.)

For complete data on Deico Motors, address Deico Products, Dayton, Ohio, or our nearest sales office.

#### DELCO MOTORS

DELCO PRODUCTS, DIVISION OF GENERAL MOTORS CORPORATION

SALES OFFICES: CHICAGO . CINCINNATI . CLEVELAND . DETROIT . HARTFORD, CONN.

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Tenthousandth Set .300" to 14", \$100.00



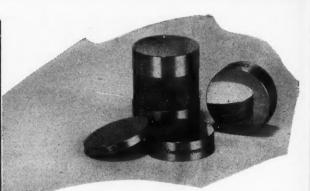
Thousandth Set .400" to 5", \$40.00



Micrometer Set 1" to 21", \$60.00



Toolmakers Set 1/16" to 2-7/64", \$17.50



# THE NEW VAN KEUREN 7/8" DIAMETER MICROGAGES ARE THE BEST BUY

60% more wearing surface . . . 25% greater accuracy . . . Body true cylinders . . . Ends square with body . . . No increase in price.

#### A Foundation For Accuracy For 25 Years

Van Keuren Microgages have been popular for over 25 years, because they provide a low cost means of securing accuracy in the shop, to meet the demands of the inspection department.

The original Microgages were made 11/16" in diameter. The 1/8" body diameter of the NEW Microgages are ground true cylinders, and the end surfaces are held square with the body within close limits. This enables them to be easily aligned on machine ways for measuring carriage travel. The new Microgages have 40% more wearing surface than rectangular gages and they wring together tenaciously. The 1/8" diameter body provides excellent rigidity for the 6" long blocks.

Microgages up to 1" length are held within a tolerance of plus 12 millionths minus 8 millionths. They have an average wear allowance of 4 millionths oversize. They are available as individual gages from .0625" to 6" length, or in sets especially designed for general shop use, for tool setting and for tool makers and machinists.

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CO., 175 WALTHAM STREET, WATERTOWN, MASS.

light Wave Equipment + Light Wave Micrometers + Gage Blacks +
Taper Insert Plug Gages + Wire Type Plug Gages + Measuring Wires
+ Thread Measuring Wires + Gear Measuring System + Shop Triangles + Carboloy Plug Gages + Carboloy Measuring Wires

GRINDING COOLANT TANK DRIP CONTROLS NO VISUAL COOLANT DRIPS INTO V-GROOVES THRU HOLES WHEELS INTO WHEEL REQUIRED POINT OF CONTACT



MINIMIZES cracking, skin softness, warpage ELIMINATES coolant pumps and dust collectors IMPROVES wheel life and surface finish FLUSHING ACTION results in fewer dressings FULL VISIBILITY for uninterrupted grinding

**Exclusive** with DoALL Surface Grinders



DOALL COMPANY

Band Saws . Machine Tools . Gage Blocks

Des Plaines, Illinois



# Stitting Success

Capital R

# CIRCLE (R) METAL SLITTING SAWS!

Staggered Teeth with Side Chip Clearance. Diameters from 3" x 3/16" to 8"x 1/4".

Side Chip Clearance. Diameters from 2½" x 1/16" to 8" x 3/16".

Hollow Ground. Diameters from  $1\frac{1}{4}$ " x 1/32" to 10" x 3/16".

Eliminate binding and dragging...take deeper cuts.

There's a **CIRCLE** (R) Metal Slitting Saw for every job!

#### CIRCULAR TOOL CO., INC.

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**Out of 1001 Test Tubes** 

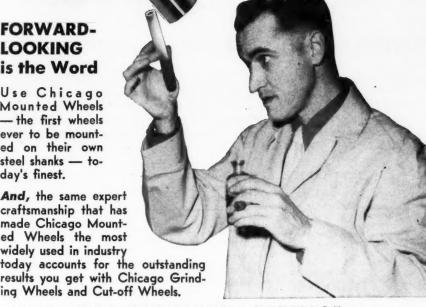
The Chicago Mounted Wheels you use today look simple enough — abrasive wheels mounted on steel shanks, but

Those little wheels are the result of more than 50 years of know-how and more than 1001 tests to determine the most exactly perfect combination of grain, grade, bond, shape, shank length and steel analysis to do each job.

#### FORWARD-LOOKING is the Word

Use Chicago Mounted Wheels - the first wheels ever to be mounted on their own steel shanks - today's finest.

And, the same expert craftsmanship that has made Chicago Mounted Wheels the most widely used in industry today accounts for the outstanding results you get with Chicago Grind-



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Let us help you with your grinding problems. Send for our Engineering Data Sheet making it easy for you to submit information from which we can recommend the abrasives that will do your jobs best. Write for free Catalog.

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# SPEEDS

ASSEMBLY...





#### KNURLED SOCKET HEAD CAP SCREW

The head of the ubiquitous "Unbrako" Socket Head Cap Screw is KNURLED to speed assembly. The KNURLS "gear" right to the fingers—the handiest of wrenches—no matter how oily, and a positive slip-proof grip is the result—no futile motion. Of course, the Internal Wrenching feature provides cost savings in material, weight and space. Sizes from No. 4 to 11/2" diameter, in a full range of lengths.



Knurling of Socket Screws originated with "Unbrako" in 1934.

You can't tighten or loosen socket screws without a hex socket wrench, so why not use our No. 25 or No. 50 "Hallowell" Key Kit, whose Hollow Handle contains most all hex socket bits.

Write us for the name and address of your nearest "Unbrako" Industrial Distributor and for your copy of the "Unbrako" Catalog.

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Manhattan Abrasive Wheel Department announces a new Molded Disc abrasive wheel for rotary sanders. Many times more abrasive grains in this bonded disc wheel, 7" diameter by 4" thick, permits the Manhattan Molded Disc to last days on jobs that usually wear out conventional coated abrasives in a few minutes!

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Bonding can be modified in various resiliencies for roughing and fast metal removal, as well as for finishing operations. Standard size  $7" \times \frac{1}{4}"$  x  $\frac{1}{8}"$ . Recommended for speeds to 6000 rpm. Write today for a trial order.

ABRASIVE WHEEL DEPARTMENT



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MANHATTAN RUBBER DIVISION

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# Sebastian LATHES

GENERAL PURPOSE LATHES
Available in
12", 16", and 20" Sizes







GAP LATHES
Made in 16" and
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Also Clutch & Brake, Line Shaft Drive, and other Special Types

All Sebastian Lathes Are Equipped with 8-Speed Geared Head



give you a full range of types and sizes to meet your requirements

give you finer lathe construction . . . greater ease of operation . . . longer, more economical service life



The new King-made, medium priced Sebastian incorporates every big lathe feature contributing to consistent accuracy and time-saving ease of operation. An unusually large number of items are furnished as standard equipment. And there's the right type and size of lathe to meet your particular shop requirements. Write for Catalog S-1 (Standard Lathes) and S-101 (Special Type Lathes).

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Builders of King Vertical Boring & Turning Machines and Sebastian Lathes



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INDIVIDUALLY TESTED to assure lasting service even under the most severe conditions. Shown in arrow from top to bottom: the Spring Clamp, and the popular Hargrave Super Clamps, Nos. 44, 40 and No. 43 which is designed especially for welding. Frames are specially forged from a tough alloy steel and heat treated. Screw is hardened steel for extra toughness and to prevent battering of the The No. 530 Carriage thread. Clamp is made of a tough alloy stronger than malleable, available in popular sizes.







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THE MODEL 381

Mall Drill



Every feature you need and want in a portable electric drill is contained in this top quality production and maintenance 3/8" MallDrill. It is light in weight, powered beyond ordinary requirements, has plenty of staying power, a comfortable handle and trigger switch, a Jacob's chuck, plus an air-cooled motor. Will drill large and small holes efficiently from the smallest to 5/8" (when 5/8" drill is used with 3/8" shank) in steel, masonry and concrete; also 1" in wood. It is quickly and easily converted to a grinder, disc sander, wire brush, hole saw, polisher, screwdriver or paint stirrer by simply interchanging the attachments in the chuck. When mounted in the Mall-Drill Stand, it serves as a drill press; when fastened in the Mall Pedestal Assembly it serves as a lathe for turning wood, a general grinder, tool and knife sharpener and other tools.

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gives engineering data full information on sprockets and chains carried in stock.

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... you can count on fast, exceptionally free cutting and extra long life . . . qualities for which all Putnam tools are noted.

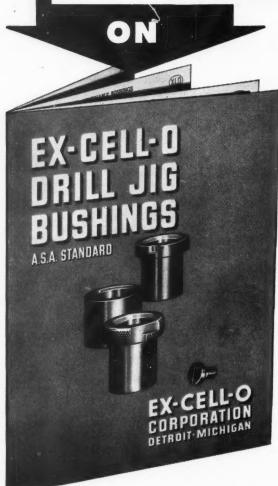
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Ex-Cell-O is a pioneer in the manufacture of drill iia bushinas to close hole limits. Naturally, these closer limits make possible longer tool life and greater accuracy, Ex-Cell-O, noted as headquarters for precision-made bushings, carries one of the largest and most varied stocks of drill jig bushings available in the world. A.S.A. Standard bushings can be obtained directly from Ex-Cell-O's Detroit and New York offices and from the Machinery Sales Company in Los Angeles. Send for Ex-Cell-O Catalog No. 11882, giving standard bushing sizes.



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EX-CELL-O CORPORATION

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Fulmer Model 412 1/2"-4" honing capacity

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THE ONLY AIR GUNS WITH ENCLOSED LEVER CONNECTED TO THE VALVE BY A BALL AND SOCKET JOINT.

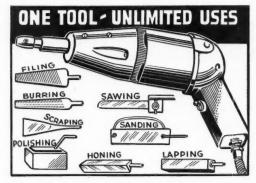
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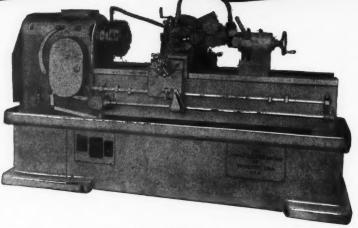
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The Backstand-Belt Method of Production Grinding, Polishing and Finishing offers

### NOT 1 BUT 5 ADVANTAGES

For grinding, polishing and finishing hundreds of consumer and industrial items, the backstand-belt method is more efficient and economical than the older set-up wheel method—because the backstand-belt has these five advantages over the set-up wheel...





- l. An abrasive belt is a scientifically made tool, manufactured under controlled conditions by experts using modern making equipment. The photomicrographs compare the crude, uncontrollable rolled-on cutting surface of (a) a typical set-up wheel with (b) the coating on an Armour Abrasive Belt. The sharp cutting points on the factory coated belt are exposed to provide faster, cleaner cutting action, increased production.
- 2. Coated abrasive belts cut cooler because of a longer interval between work contacts.
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- 4. It takes only a few seconds to change a coated abrasive belt.
- 5. Temperature-controlled room for curing set-up wheels can be released for other uses.

Actually, there are more than five advantages to the backstand-belt method. For additional information send coupon at left for our new informative booklet-"Facts about Backstand-Belt Grinding and Polishing."



The McCaskey Register Co., manufacturer of cash registers and bookkeeping equipment, improved polishing and deburring time on stamped out register covers 40% by switching to the backstand-belt. Whether you are polishing flat or contoured surfaces, cast, stamped or forged pieces, try backstand-belts.

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The work is held in an air-operated combination chuck and fixture. Then:

1st T. F.: Rough bore hole and two counterbores; chamfer O. D. of Hub

2nd T.F.: Finish above cuts; chamfer counterbore

3rd T. F.: Machine oil slinger groove; machine snap ring groove; rough form ball race and face end

4th T. F.: Machine ball radius with single point tool

5th T. F.: Size bore counterbore



Do The Job With Maximum Speed At Minimum Cost On This Powerful, Precise P&J 4DE Automatic Turret Lathe with 15 changes of speed arranged in 5 sets of 3 automatic changes; 27 feeds arranged in geometric progression; built for permanency of alignment, freedom from scoring, and long life.

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DONE IN 2.28 MINUTES

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Skilful tooling—the ability to group and combine operations, often on a single turret face—is the secret of the outstanding success with which Potter & Johnston combines high precision with high speed and consequent low cost parts production.

That is why you may find it very much worth your while to submit your parts or prints to P&J for tooling suggestions, estimates and time studies. It involves you in no obligation and may uncover savings of truly great significance.

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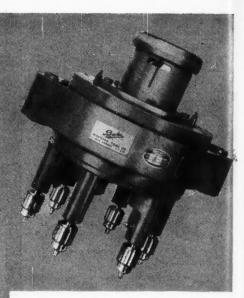
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MULTIPLE SPINDLE DRILLING AND TAPPING HEADS FOR **PRODUCTION** 

> BUHR BUILDS ALL TYPES OF SPECIAL EXEL PENTER AND FOR HIGH PRODUC-TION UNDER SEVERE **OPERATING** CONDITIONS



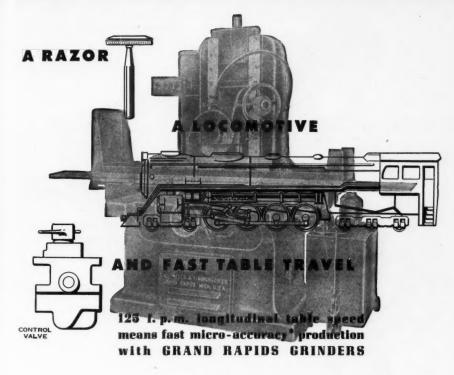
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BUHR MACHINE TOOL COMPANY

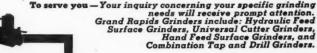
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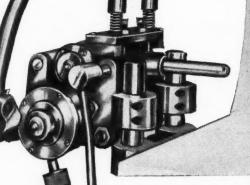
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NOW YOU CAN heat treat, harden and temper small parts in your own plant . . . without ex-perienced heat treaters. Economical to install and use, Cooley Electric Furnaces operate efficiently at high or low heats, and save your large furnace time for work requiring large volume capacity. Here are some profitable uses:

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CHAMBER	8"W 6"H 14"L			10"W 6"H 18"L				8"W 6"H 14"L	
MAX. TEMP.	1850° F. 14.8 at 230 v. 3400			18500 F. 19.6 at 230 v. 4500				20000 F. 20.2 at 230 v. 4650	
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PRICE	200.00 230.00	250.00	280.00	295.00	325.00	345.00	375.00	420.00	340.00

- M models complete with hinged door and hearth plate.
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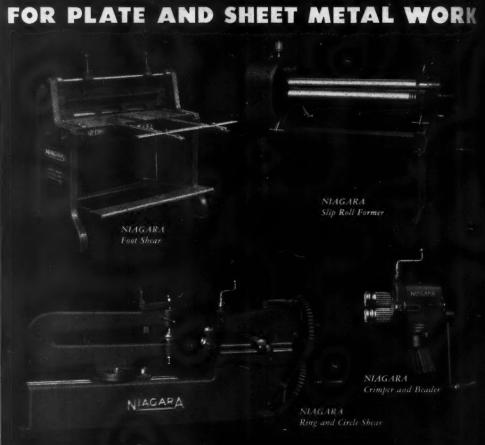
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NIAGAR.



You can save hundreds of dollars a year with this Atlas miller on the job for small parts milling.

Its original cost is low — \$315 for the Change-O-Matic machine, F.O.B., Kalamazoo, less arbor and motor. It will save many hours a month on set-ups — save on power and operating costs — and free your big machines for the jobs that only they can handle.

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146 N. PITCHER STREET KALAMAZOO, MICHIGAN



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Put on—take off—as you would a boring chuck— Jig Grind—on your Jig Borer or Mill.

# JIG GRINDING With the Vulcanaire

The Vulcanaire System . . . Includes an adapter to fit the spindle of your machine tool Vacuum dust collector Filter and Oiler Pressure Gauge Speed Regulator

When Jig Grinding is needed you can have it quickly and economically with the VULCANAIRE. Place it in the spindle of your jig borer (or mill).

AND . . Locate — Finish Grind holes in hardened steel to "tenths" at controlled speeds up to 65000 RPM

- ... Grind dowel holes square with a ground base
- . . Move location of holes in hardened steel blocks
- . . Grind interchangeable holes in hardened sections
- . . Grind .032 to  $\frac{1}{8}$  holes with diamond impregnated laps
- Grind contours and relief with tungsten carbide burrs
- . . Grind radii in die sections
- . . Grind contours in gages

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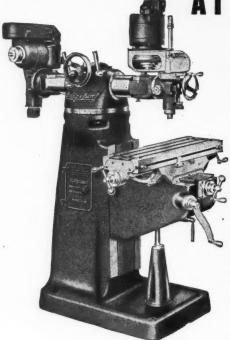
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for quotation, mentioning
machine tool application.

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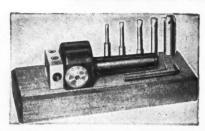


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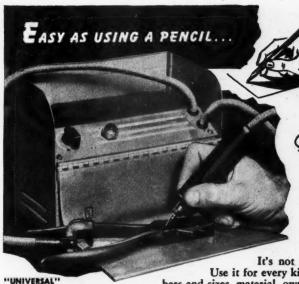
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# Machine Shop

JANUARY, 1949

Vol. 21, No. 8

CINCINNATI, OHIO

### This Month

For our feature article this month we present the first of a series of articles authored by W. R. Bennett titled "Practical Pointers on Steel Treating." As the title implies, these articles are written from the practical standpoint and contain a vast amount of valuable information which has been gleaned from Mr. Bennett's 50 years of active work in steel treating. The reader will find the author's presentation unusually clear and understandable.

Mr. Hinman devotes the eleventh article of his series on Progressive Die Design to a description of a progressive die for piercing, blanking, shearing, forming and ejecting brass movement plates. Page 114.

Eric Guilbert, Safety Director of Republic Drill and Tool Company, explains several procedures to follow when the problem of "selling" safety devices to workers arises. He also describes several practical safety measures which can easily be adopted for machine tools in his article "Machine Tool Guards." Page 124.

Don H. Wimmer reports on the recent Production Conference of the American Management Association. Many of the important problems confronting industry today formed the basis of talks given at this meeting by leading figures in the field of management. Page 128.

"A Philosophy of Human Relations" by Dillard E. Bird is the first of a series of articles in which the author clarifies some of the basic issues involved in the consideration of Human Relations problems. Mr. Bird will welcome comments and questions on Human Relations. Page 152.

A fine assortment of job stories which describe the manner in which the application of new tools and equipment enables manufacturers to obtain higher production and more accurately finished work is presented in "Modern Equipment at Work." Page 188.

The handy reference section "Where To Get It" appears on pages 352, 353, and 354.

"Over the Editor's Desk" will be found on page 358.

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### **Practical Pointers** on Steel Treating

W. R. Bennett

This article is the first of a series in which the author will draw upon his fifty years of experience in the heat treating of tool steels.

By W. R. BENNETT

N experienced lathe operator a usually becomes so efficient at his own job that it would be difficult for any other person-even an experienced mechanic-to take his machine and equal his production. Through his con-

tinuous experience he becomes almost an integral part of the machine. He knows its capabilities and its peculiarities. However, by no stretch of the imagination could he call himself an all-around machinist.

> The single-track ability described above is characteristic of the tool hardener, who, from day to day and year to year, continues to harden the same class of work until he becomes exceptionally proficient. He cannot, however, be classed as a steel treaterparticularly a commercial steel treater. The latter's work is extremely varied. He never knows what is coming next. He must, however, be



"The steel treater should be able to handle any job that is presented to him, regardless of the nature of the work.

able to handle any job that is presented to him, regardless of the nature of the work. Both the hardener and steel treater may excel in their respective fields, but should not be accorded the same classification.

### Noting the Weak Points

When a physician is called to attend a patient, he immediately endeavors to locate the weak point—the source of the trouble. He pays little attention to the unaffected parts of the patient, assuring himself that they will take care of themselves. Like the physician, the steel treater should, when a tool or die is delivered for treatment, locate the weaker points and give them special attention, particularly as regards the first operation, which is the application of the heat.

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### The Steel Treater Protects Himself

Before primary heating is attempted, the steel treater should not take it for granted that the written or oral order for treatment is correct. Many costly mistakes have been made due to the acceptance of erroneous information or instructions. It is a relatively simple matter to trace mistakes to their course, but it will be of little help to trace the error after the damage has been done. Incidents similar to the following are frequent occurrences.

A die is presented to the steel treater together with an order which reads as follows: "Heat treat one oil-hardening die." To the clerk who wrote the order it means just what it says and nothing more. To the hardener, the instructions may mean that the die is made of a straight oil-hardening manganese steel requiring a temperature for hardening of 1450 deg. F. On the other hand, it might mean that the die is made of high-carbon, high-chrome steel requiring a hardening temperature of 1650 deg. F., or that

### W. R. Bennett

A FTER graduating from the New Britain, Connecticut, High School, W. R. Bennett served as an apprentice to his father in the hardening department of The Pratt & Whitney Company in Hartford, Connecticut.

Later he was placed in charge of the heat treating department at the Stanley Works, New Britain. Here the work consisted of cold striking and forming dies, broaches, blank-

ing dies and punches.

He later joined the New Departure Company of Bristol, Connecticut, where, as superintendent of the heat treating department, he was confronted with a wider variety of work, consisting of treating cups and cones for ball bearings, balls, broaches, counterbores and circular forming cutters. The experience gained in these different factories convinced him that he was sufficiently proficient to enter the commercial steel treating business. As a consequence, he founded the Bennett Metal Treating Company of Newark, New Jersey. A contributing factor to the success of the business was the confidence in his ability which prompted him to insure his work against cracking. Mr. Bennett boasts that he never lost an insured job.

The many problems which confronted him during the years of his varied work gave him opportunities for study and experimentation which resulted in the invention of new equipment and methods. He is the patentee of "Triad" furnace, the "Intervol" furnace, the "Expelox Tube," Detector Rod, and the "Wet Nitriding Process."

After fifty years of active work at the fires, the author retired. He now devotes much of his time imparting his knowledge to others engaged in the profession in order that they may benefit from his ex-

perience.

the die is made of high speed steel demanding a temperature of 2275 deg. F. for proper treatment. All of these steels are of the oil-hardening variety, but they are all hardened at different temperatures.

For his own protection, the hardener should determine for himself the type of steel of which the die is made. Lacking a laboratory or a sample for testing purposes, spark testing can be used with quite satisfactory results. Steels of various types and analyses reveal positive indications of their composition upon contact with a grinding wheel. The classifications of the universally-employed steels mentioned above, together with the straight carbon water-hardening steels, may readily be determined. When confronted with a piece made from one of the wide varieties of available alloys, however, the inexperienced tester may run into difficulties. Spark testing in all of its ramifications is an art. Many men are devoting a large part of their time to the spark testing technique and the results of their findings are usually made available to those who want to make use of this information.

It is not surprising, therefore, that the steel treater who is devoting his full time to steel treating seldom qualifies as an expert tester. However, he should be able to determine the characteristics of the steels that he is called upon to treat, thus ensuring against possible failure. Knowledge of the spark testing technique should be a "must" in every hardening shop. Every hardening department should be equipped with a grinding wheel for testing purposes, and it should be used for testing only. A hard wheel is essential for this task, and it should be of a type which may be operated at a fairly high speed. The test wheel should never be equipped with a guard, because the guard obstructs the spark line and prevents the spark from traveling freely through its natural course.

The writer remembers being called to a factory where drift pin reamers of both high speed and fast finishing tungsten steels were being manufactured. Through some one's error a quantity of the finished reamers of both kinds had been mixed together. They were identical in size and appearance, but when put through a competitive test against other high speed steel reamers, those made of the fast finishing steel broke down. Upon examination of the plant's testing wheel, I noted that the guard was so designed and positioned that it interfered with the free travel of the sparks when the steel was tested, and suggested that it be removed. With the guard removed, it was discovered that the sparks from the fast finishing steel broke about seven inches from the wheel, while the high speed steel sparks faded at a distance of about three inches. The reamers were tested and separated, and the trouble vanished.

In the absence of a grinding wheel for spark testing, a match and clean file will, in many instances, serve as a satisfactory substitute. With the workpiece held in a vise or by other suitable means, a file should be passed over the piece while a lighted match is held under the file at the point where it leaves the steel. As the minute chips fall from the file into the flame they will ignite and will develop sparks the characteristics of which are as readily discernible as those which are obtained from contact of the steel with a grinding wheel.

### **Preheating All Steels**

The advantages obtainable by preheating, where preheating is possible, are manifest. Preheating requires extra time and therefore is often considered wasteful, but the fact remains that if work is preheated at a lower temperature than that employed for final heating, the steel is given a beneficial start and the time required for its stay in the higher heat oven is reduced, consequently little or no time is wasted. Preheating is recommended for the purpose of giving the steel an easy start, and the temperatures employed for preheating, irrespective of the type or analysis of the steel should not be so high as to induce scale or

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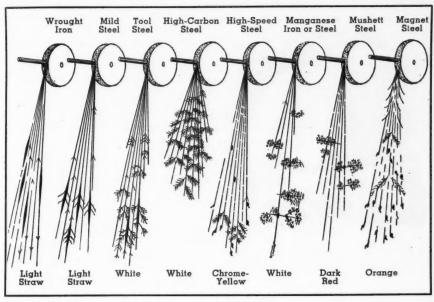
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harmed during the period of increasing or rising heat. It is often ruined, however, after the temperature has reached the critical limit.

### **Furnace Oven Preparation**

We have now reached the point at which it might be assumed that we are ready to insert the tool for heating



"Steels of various types and analyses reveal positive indication of their composition upon contact with a grinding wheel."

oxidation. Any scale developed during the preheating operation will not be obliterated in the final heating; thus the result will be a scaled piece.

In point of fact, any preheating temperature that is high enough to cause scale to develop is altogether too high. The question might be raised as to whether, with a low preheat, the time lag in the final heat will be altogether too great. The answer is that it will not. The added time in the final heating is so little that it can hardly be noticed. High speed steel is seldom

prior to the quench. There is, however, one more essential factor to consider. How about oven temperature? Most assuredly we would not wish to oxidize or scale a perfectly good tool. We must then set our burner so that it will maintain a continuous flow of correctly-mixed air and fuel. Let us assume that we have attended to all the details. Let us also assume that we are equipped with only one heating unit and therefore must dispense with preheating.

At what oven temperature should

we begin the heating operation? There is nothing to be gained by heating an oven only half way and then inserting a tool to be hardened. Forcing an oven in which a piece is being heated is bad practice and results in too-rapid heating of the smaller parts of the tool. If we are about to process a straight carbon water hardening blanking die, requiring a heating for hardening tem-



"In the absence of a grinding wheel for spark testing, a match and clean file will, in many instances, serve as a satisfactory substitute."

perature of 1450 deg. F., it is well to have the oven temperature at or near 1450 deg. F. but not above that point.

The burners should be toned down so that they are barely firing. This procedure, aided by the cooling influence of the die, will lower oven temperature and in a short time the temperatures of the pieces and oven will correspond. In other words, they will have evened up. The fuel influence may then be gradually increased and the temperature of the workpiece and the oven will rise to the critical point together. This method of heating in a semi-muffle furnace approaches as nearly as possible the effect of preheating and assures uniformity in heating.

If either a non-oxidizing or oxidizing atmosphere is required, the gas or oilfired oven may be regulated by adjusting the fuel and air valves to maintain a "fat" or "lean" (meaning a nonoxidizing or an oxidizing) furnace atmosphere. The electric oven is usually equipped with means for introducing gas into the heating chamber from the outside in order to expel or prevent the entrance of oxygen-which is the oxidizing influence-from entering the oven. Recently published advice relative to heating suggests that the furnace oven should be up to full heat and that the piece should be placed in the oven at that heat and then be allowed to heat as fast as it can. It is a matter of conjecture as to just what would happen to the finer, unprotected points of an expansion reamer, a threeinch pipe tap or any other tool if this procedure were followed. In point of fact, I am still of the opinion that it is much better to "speak well of the bridge that carries one safely over" and that some of the suggestions occasionally brought forth might well be questioned.

### **Temperature Control**

Any furnace, whether it be heated by electricity, gas or oil and provided close attention is given to its ability to maintain a uniform heating chamber and correct atmosphere, either manually or mechanically controlled, is suitable for the treatment of all types of steel.

There are still a number of old-time steel treaters who are nominally successful without employing heat calibrating instruments. They are, however, decidedly in the minority. In the old days these men had to work without pyrometers. They determined temperatures by fracture, and fracture was their heat-determination guide. It was generally understood that the finest fracture obtained in a piece of steel

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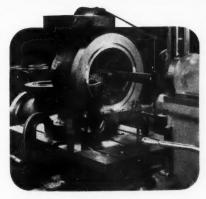
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# Internal Shaping...



Here is a 32" Cincinnati shaping the guides on a 10" class 600-lb. flanged end gate valve body. Cut length is 16"; feed, .010".

SOLVED THE PROBLEM Internal shaping is the answer to a long list of "hard-to-get-at jobs." The illustration shows two Cincinnati Shapers of a battery of ten machines shaping both male and female valve guides at the Powell Valve Company.

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Write for Shaper Catalog N-4 for complete description of Cincinnati Shapers.



THE CINCINNATI SHAPER CO.

CINCINNATI 25. OHIO U.S.A. SHAPERS - SHEARS - BRAKES resulted only from the use of the correct heating temperature. They would procure a piece of steel of the same analysis as the tool they were about to harden and forge it into a one-half inch square bar. The bar would then be cut in two-inch lengths and the pieces would be hardened separately. After each piece had been quenched, it was broken and the fracture was examined. If one proved satisfactory, the workpiece was heated to approximately the same temperature. Fracture and optical comparison were the old timers' pyrometers.

In these days when a few degrees of heat, more or less, are important, heat calibrating instruments are necessary and no heating oven is complete unless it is equipped with temperature-determining instruments. The temperatures indicated by the pyrometer, however, are only oven temperatures. They do not reveal the temperature of the workpiece being heated, therefore the hardener must use his own judgment in determing the proper moment to remove the work for quenching.

Let us assume that we have a hearth-type semi-muffle furnace, operating at a temperature of 1450 deg. F. We know that the calibrating instrument is registering correctly. The "fire end," however, is located quite some distance from the piece being heated. Only by optical comparison between the color of the fire end and the color of the piece are we able to determine the correct moment that the piece must be removed for quenching. The correct location of the fire end appears to be overlooked in many hardening shops. Some steel treaters believe that inasmuch as the furnace oven is equipped with a pyrometer, it makes little difference where the fire end is located. One would almost be led to believe that it is considered just another gadget.

Inasmuch as the use of a pyrometer does, in the final analysis, revert

to an optical comparison of the colors of the fire end and the color of the piece in process of being heated, it is advisable that the fire end be located in as close proximity to the workpiece as is possible, thus assuring a reasonably accurate comparison. One might inquire if it is not advisable to allow the piece to soak in the oven long enough to afford a reasonable certainty of its being heated to the same temperature as the oven. One is also inclined to ask "What benefit is obtained by soaking at the critical temperature?" The answer invariably will be "To make sure that the piece is heated through." If a die is correctly heated, there can be no necessity for soaking.

### **Atmospheric Control**

Let us first determine just what influence oven atmosphere has on a piece being heated. The use of correct temperatures alone is not a guarantee of satisfactory hardening results. Let us define the three atmospheres; oxidizing, reducing and neutral.

An oxidizing atmosphere is developed when the amount of fuel passing through the burner is insufficient to provide heat that will consume an excessive amount of air-oxygen, thus resulting in a scaled or oxidized piece.

A reducing atmosphere is non-oxidizing and is developed when the amount of fuel supplied creates flame sufficient to burn more oxygen than the air contains. A neutral atmosphere, one not easy to develop in any stock furnace now on the market, is neither non-oxidizing nor oxidizing. It is what the work implies—neutral. It means that an exact amount of fuel and just enough air, combined and consumed simultaneously, create a balanced atmosphere.

Practically all of the manufacturers of heat treating furnaces make it a point to equip their furnaces with atPROVED

## MAKING THE BIG CHIPS FLY!

## Sunoco Emulsifying Cutting Oil Is Used for Rough-Finishing Heavy SAE 3140 Forgings

The correct cutting fluid is a big factor in the continuous heavy-duty machining of tough steel forgings on the machine shown above.

Machine: Warner & Swasey #-A Heavy-Duty Turret Lathe

Material: SAE 3140 Forging

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Operation: Roughing-Out Cap for Pile-Driving Machine
Cutting Fluid: 1 part Sunoco Emulsifying Cutting Oil
to 20 parts water

Sunoco Emulsifying Cutting Oil is a viscous, self-emulsifying oil that quickly and easily forms a stable emulsion with water. It contains no animal or vegetable fats, and will not turn rancid.

Sunoco Emulsifying Cutting Oil meets the demand not only of tough cutting jobs, but also of a wide range of turning, milling and grinding operations calling for close tolerances and fine finishes. It is particularly efficient where precision is demanded in high-speed machining.

For full information, and samples for testing in your machines, call your nearest Sun office, or write Dept. MM.

### SUN OIL COMPANY • Philadelphia 3, Pa.

In Canada: Sun Oil Company, Ltd.
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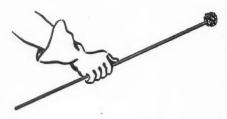
SUN PETROLEUM PRODUCTS

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"JOB PROVED" IN EVERY INDUSTRY

mosphere controls. A furnace so constructed that it cannot be operated under correct atmospheric conditions is a liability and should be discarded. The fundamental requisite for correct atmospheric condition is the exclusion of excess air or oxygen. It is therefore necessary to employ means to bring about this result.

The introduction of automatic atmosphere controls is a step in the right direction. I do not believe, however,



"Obtain a quarter-inch rod about three feet long, wind it with asbestos rope to the size of a golf ball at one end and secure the rope tightly with wire."

that the operator should depend entirely on these controls. He should be able to determine for himself just what constitutes correct atmosphere, and should be able to detect faulty operation at the exact moment that these controls fail to function properly or do not "automat" under all conditions.

If a door opening of a semi-muffle, gas or oil-fired furnace is as wide as the hearth or floor of the oven, when the door is opened for the purpose of inserting or removing workpieces there is an inrush of air and if there are a number of pieces being heated, those which are removed last will be immediately attacked by the oxidizing element in the air. The last pieces removed will show an increasing amount of scale, before and after quenching. In other words, if the fire is running under perfect atmospheric conditions

when the door is closed, it does not and cannot maintain correct atmosphere when it is opened. The fact that there is about 14.7 lb. atmospheric pressure per square inch at sea level is sufficient evidence that nothing will prevent the entrance of air into the oven. Inasmuch as this is true, would it not be to our advantage if we were able to obtain and maintain correct atmospheric condition indefinitely?

This condition may be maintained in a simple manner. Remove the oven door entirely, or open it to its full extent. Block the opening with semiinsulating brick, leaving the opening only large enough to permit insertion and removal of the workpieces. Adjust the fire by setting the fuel and air valves to the point where more fuel than the air is able to consume enters the heating chamber. This excessive fuel produces an excess of flame which must escape somewhere. With a door fully closed, the excess flame issues through the ports or openings at the top of the oven. With the opening set as described, the excess flame will pass through the front opening and immediately as it comes into contact with the outside air, it will burn the oxygen that is intent on entering.

We must bear in mind that there is as much danger of oxidation from the burner as there is at the door opening and that if we induce an excessive amount of air through the burner, a sharp, cutting fire will result and the heating chamber will not function correctly. And while the front opening may be filled with flame to its full area, the flame may be issuing at a too great velocity, thus becoming oxidizing and not non-oxidizing. Another advantage of the fixed opening is the fact that one is enabled to observe the pieces being heated at all times, and can remove them at will or change their position on the hearth as desired.

For many years, steel treaters have been familiar with the practice of plac-

## One a minute-

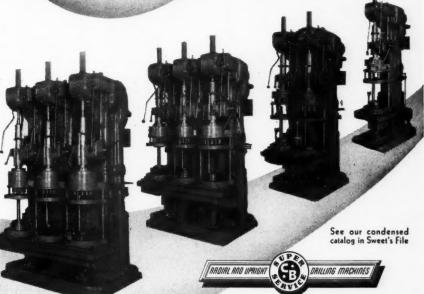


This battery of highly productive 21" and 24" Cincinnati Bickford Super Service Direct Drive Drills is drilling 24—.257" holes; tapping 24— $\frac{5}{8}$ " holes; step drilling  $4-\frac{13}{2}$ " x  $\frac{7}{18}$ " diameter holes 15%" deep; tapping  $4-\frac{5}{8}$ " holes in this crank case housing.

The operations are performed on both ends of three sizes of castings. All operations are completed at the rate of one a minute.

These Direct Drive Drilling Machines are made in the following sizes: 21" with 3 or 4 horsepower motor; 24" with 5 or 7½ horsepower motor; 28" with 7½ or 10 horsepower motor.

Write for Booklet U-27 for complete description.



THE CINCINNATI BICKFORD TOOL CO. Cincinnati 9. Ohio U.S.A.

January, 1949

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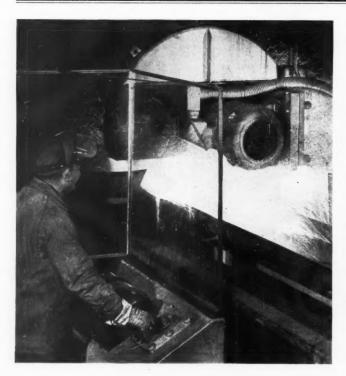
MODERN MACHINE SHOP

Equal Efficiency of Every Unit Makes the Balanced Machine

109

ing small pieces of dry wood or small balls of paper on the floor of a heated oven in order to determine the character of the atmosphere. This method will give satisfactory results when the oven is provided with a small hearth. Any inflammable piece, however, when placed in a given location, will reveal the atmosphere only at a point where it is in fairly close proximity to the piece. It is universally understood that should the piece burn with an easily discernible flame, the surrounding atmosphere is saturated with oxygen, otherwise the material could not burn. An atmosphere containing oxygen is an oxidizing atmosphere. If, however, the wood takes on the heat of the oven without developing a flame, the oven is to all intents and purposes nonoxidizing. If, however, the hardener is operating a furnace containing a large hearth, neither of the above testing methods is conclusive.

If we make our test at a certain localized point, we cannot assure ourselves that, at a distance 15 inches from that spot, the fire is maintaining the same atmosphere. A much better and more simple arrangement is suggested. Obtain a quarter-inch rod about three feet long, wind it with asbestos rope to the size of a golf ball at one end and secure the rope tightly with wire. Submerge the ball in either kerosene or fuel oil and then insert it through the front opening at any or all points of the hearth, and note whether it flames as described above. The operation requires but a few seconds. This test can be made throughout the entire furnace area.



New Saw Melts Steel as It Cuts 13 Feet a Minute. Built to exacting specifications of United States Steel Supply Company engineers, the 60inch blade shown here is operated by remote electrical control and was designed to make square, burrless cuts across heavy steel sections, such as structural shapes. Its teeth whirr faster than 320 miles on hour at its normal speed of 1,750 rpm. When the blade makes contact with hard, tough steel, friction generates heat more rapidly than material can absorb it. The intense heat melts the surface and the teeth carry it away.

**Even Doughnuts** Are Improved



Material - Seamless

Hole size - from 1' to 234" dia. Hardness - 35 Rock-

well C (approx.) Stock removal --- .003" Production rate - 20 cutters per hour

Ability to hold .0002 Tolerance Ended Air Leakage Between These **Doughnut Cutter Parts** 

... at Doughnut Corp. of America, Ellicott City, Md.

he air seal in this doughnut cutter assembly is extremely important. Air leakage would allow dough to be forced between these mating parts - and cause a shutdown of the doughnut machine.

SUNNEN HONING produced a straight, round hole in this thin-walled cutter - accurate within .0002" - with an extremely fine surface finish.

The doughnut production problem was solved. In addition, the Sunnen honed parts last longer, and the doughnut machines are more efficient.

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- Hone Any Diameter from .120"
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- Produce Straight, Round Holes accuracy guaranteed within

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"Low-cost production of precision holes"

January, 1949

MODERN MACHINE SHOP

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# Roto-Clone takes buffing dust off the danger list

BUFFING metal parts in this finishing department produces a fibrous, greasy dust that could be both a health and fire hazard. But not here—as fast as this dangerous dust is produced it is whisked away by a Type N Roto-Clone\*.

The Type N Roto-Clone is a wettype collector which combines centrifugal forces and intimate intermixing of water and dust-laden air for extremely high cleaning efficiency. Compact in design, this unit has no moving parts to foul and requires little maintenance. And the once dangerous fibrous, greasy dust is converted into a harmless sludge which is easily removed. Whether you have one or a battery

of buffing stands, there is a Type N Roto-Clone of a size and capacity that will remove and store this dust safely and efficiently. Bulletin No. 277 describes this unit in detail. Ask your local AAF representative for a copy or write direct to—

AMERICAN AIR FILTER COMPANY, INC.

100 Central Avenue, Louisville 8, Ky.

In Canada: Darling Bros., Ltd., Montreal, P. Q.

Rot will ren

One of seven Type N Roto-Clones servicing buffing stands in this metal finishing department.



\*Roto-Clone is the trade mark (Reg. U.S. Pat. Off.) of the American Air Filter Company, Inc., for various dust collectors of the dynamic precipitator and hydro-static precipitator types. ROTO-CLONE®

DUST CONTROL EQUIPMENT



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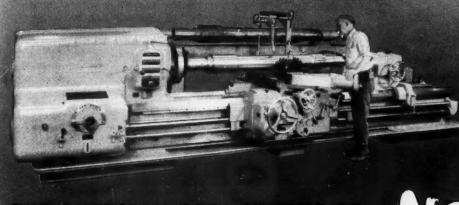
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## Progressive Die Design, Part XI

Description of a Progressive Die for Piercing, Blanking, Shearing, Forming, and Ejecting Brass Movement Plates

By C. W. HINMAN

Designing Engineer

THE drawing Fig. 29 serves to illustrate a small brass movement plate that is now being produced in large quantities and at high speed in a six-station progressive die. Drawing Fig. 30 shows the die which was designed and built for the purpose of fabricating the movement plates in the quantities and at the speed desired. The drawing of the die provides a good example of the drafting technique which is ordinarily employed by first-

class tool engineers in the presentation of progressive die designs.

Of particular interest in the fabrication of the movement plate are the two plugs Z, which after being pierced with round holes are formed up at a right-angle bend. Since in a final assembling operation the two pierced holes must be accurately aligned with the bearings of a governor worm, they are pierced 0.005 inch undersize during the forming operation and subsequently line reamed to the required diameter dimension. Line reaming provides the means for accurately aligning holes which are located on opposite sides of a workpiece, as in the case of this movement plate where holes are first pierced in the lugs while the lugs are in the flat stock and the lugs are then later formed up at a rightangle bend.

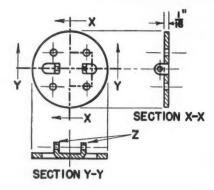


Fig. 29—Drawing of a brass movement plate which is designed with two sheared and formed lugs Z. The movement plate is produced progressively, one plate per press stroke.

### Die Construction and Operation

Strip stock is fed into the die from right to left. Strip is furnished from a coil of stock mounted on a reel at the right-hand side of the press. A "hitch feeding device" (not shown in the drawing) is attached to the right end of the die. Dickerman Hitch Feeds

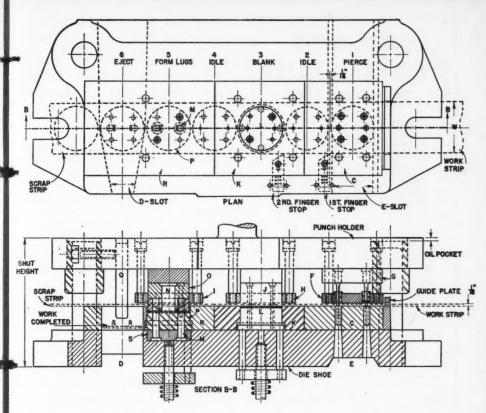


Fig. 30—Design of a high-speed six station progressive die for producing 5,000 complete movement plates per hour.

or Die Roll Feeds may be used for handling light strips such as the one shown here. Guide pins are provided at the sides of the strip for keeping it in a straight line after it is guided through a slot in a plate secured on the entering end of die block C, in station 1.

Beginning at the right end of the die, a new strip is entered and then halted by depressing the first finger stop, and when the punches descend, six holes are pierced at station 1. However, this die is too great in length to permit slugs from station 1 to pass out through the opening in the press

bed, and slot E is provided across the bottom of the die shoe into which the slugs fall onto the bolster plate. The slugs are then blown from the slot by means of compressed air.

Die blocks C and R are made of machinery steel, thus reducing die-making time and cost. The cutting edges in block C are provided with six hardened and ground bushings, and in block R, shearing and forming edges are provided with a hardened die block attached on punch O. This feature is indicated by the section lining in section B—B where cast steel is shown in coarse section lines, machinery steel

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## CHICAGO STEEL PRESS BRAKE

Model No. 131



A new member of the Chicago Press Brake family designed to supplement the larger machines.

Within its rated capacity (11 tons) all operations are handled same as on the larger machines.

All steel construction, enclosed gearing.

Takes up small floor space. We can make excellent deliveries of this new press.

We make complete line of dies for all Press Brakes.

Send for Bulletin 131 for further description

## DREIS & KRUMP MFG. CO.

7418 LOOMIS BLVD. • CHICAGO 36

in fine section lines, and tool steel in double section lines.

The two small punches that pierce holes in lugs Z, are guided through hardened shouldered bushings which are press fitted in attached stripper plate F. These punches are provided with "stub points" which permit the use of guide bushings of larger inside diameters than those of the cutting points. This type of bushing provides "stiffer" guiding of the punches and avoids breaking their slender faces. Notice the extra thickness of punch plate G. Punch plate thickness should never be less than 11/2 times the body diameter of piercing punches, unless the punches are unusually large. All piercing punches are turned from one piece of drill rod and are provided with square corners under round heads. This ensures that punches will not be pulled from the punch plate when stripping, as frequently occurs when the ends of punches are peened over into countersunk holes.

Station 2 is idle, thus providing space between stations for clearing stripper plates, **F**, **H**, and **I**. The next advance of the strip carries its forward end against the second depressed finger stop. This stop is positioned one blanking center distance from the first stop. After the next descent of the punches, the job is ready to be run at high speed tempo in conjunction with the automatic feed. Two pilot punches in station 3 are designed to engage in previously pierced holes, align the spaces, and locate the blanking centers correctly.

Station 3 is a compound blanking die. Here, the blank diameter of the workpiece is cut on the down stroke. Blanking punch J cuts the blank into die block K and, continuing to descend, carries it downward against the face of spring shedder L, while spring pad H holds down the strip. Spring shedder L "banks" on the die shoe. On the up-stroke, the shedder follows the

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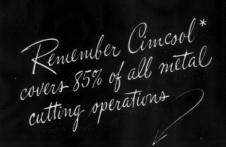
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THE CINCINNATI MILLING
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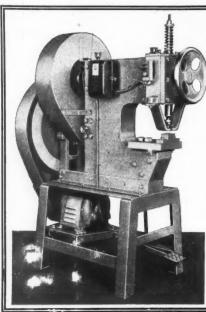
OF ALL METAL CUTTING JOBS

blank upward and inserts it up into the hole in the strip from whence it came, and spring pad H holds down the strip while this occurs. Inserting a blank in the strip can be successfully performed if the blank is sufficiently thick is relation to its diameter, and in this die we have that condition. Station 4 is an idle station for the same reason that was explained for station two.

Next, the strip and work are advanced into station 5. This station is another compound die, and when the punches descend, lugs Z are sheared through the blank and formed up, as shown at section Y—Y in Fig. 29. Punches M shear and form up the lugs against the edges of a die block which it attached to the face of punch O. The faces of punches M are provided with a 5 deg. angular slant for shearing, and slightly rounded heels for forming and "ironing" the lugs against the sides of punch N, while the blank

is positioned by two pilots and held down firmly in shedder P, on the decending movement of punch O. Punch N is inserted within a larger punch O, the latter being 0.005 inch less in diameter than the blank and die opening P. When punch O descends, it pushes the inserted blank out of the strip and carries it down against the spring shedder, and on the up-stroke, the blank is reinserted into the strip in a manner similar to that described for station 3. Spaces equal to the material thickness are provided between the sides of punches M and N, and punches M are sliding fits within shedder P that surrounds them. The workpiece is finished at station 5, and is "spanked" to shape and size at the extreme down stroke of the press ram.

Station 6 is located only one blanking center distance ahead of station 5. An idle station is unnecessary between 5 and 6 because no additional work is performed except to eject the



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For Light Structural Fabricating.

Punches Web and Flanges of Beams
and Channels.

Punches Legs of Angles and Tees.

PRATURES. Carol Block France

FEATURES: Steel Plate Frame

Non-repeat clutch
Punch lowered by hand wheel
for accurate centering

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## THE New MODEL 1100 HYBCO TAP GRINDER



- Capacities No. 2 Mach. Screw to  $1\frac{1}{2}$  Hand Taps.
- All Settings Adjustable To Give Any Angle—Relief—Hook.
- Taps Heid in Precision Collets Can Be Sharpened After Center is Destroyed.
- Standard Motor Any Current Specification.

Representatives in Principal Cities

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1277 West 3rd Street Cleveland 13, Ohio finished work. The completed work is ejected from the strip on the down stroke of punch finger Q. This punch is adjustable in height by means of the set-screw which holds it in position. The work is pushed out of the strip where it falls through an opening into channel D onto the bolster plate under the die shoe. The work slides out to the rear if the press is tilted, or it can be blown out by means of compressed air if the die is of level type. It is impossible to pass the work out through the opening in the press bed at this station because this die is so long that the station is beyond the opening, similarly as at station 1. An opening into channel D in front of the die shoe provides a space into which the operator may reach to disengage the pieces if they should become tangled.

This job is run on a No. 4 press which is speeded up to 90 strokes per minute, the hourly output being about 5,000 pieces. The strip enters the die over a table attached on the right end of the die shoe. The table is not shown in the sketch.

As Ye Sow. Soon, possibly by the time of the 1952 elections, we shall have an undisguised Labor Party in the field. This possibility is apparent to anyone who has studied the recent increased political activity of labor union leaders and the effect of this activity on the party conventions.

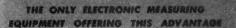
At least one aspect of the development of such a party will present a refreshing and absorbing change. As a party, Organized Labor will be responsible for its actions, instead of following its present course of dictating policy and ducking the consequences. Business will observe the acceptance of this responsibility with a great deal of interest.

-Manufacturers Record.

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Makes quality control easy—fast. Simple setting provides readings of .0001", .00005", .00002", and .00001". Intermediate settings can be made easily to match prescribed tolerance limits. The amplifier unit is shown below. For catalog describing exclusive advantages of this modern quality-control aid to mass production gaging, write Brown & Sharpe Mfg. Co., Providence 1, R. I., U. S. A.

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Range, 0-4". Simplified setting. One master only. Reversible anvil. Selfchecking. Shock-protected.



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ATTACHMENT No. 952
Range ½" to 2". One
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For mounting in jig or fixture. Its range of measurement is .002". Dust and moisture proof.



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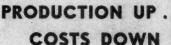
SEE IT! TRY IT! You'll be amazed at the difference it makes when you use this new Hannifin push button operated air control valve. Without effort, a quick, full power stroke every time! No throttling possible; no short-stroking. Use it to boost production.

10 WATT SOLENOIDS — No pounding... no noise ... no relays needed. Solenoids continuously rated; only momentary contact required. Speeds of 180 cycles per minute, or more!

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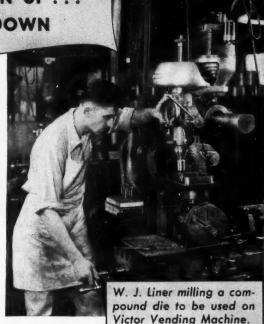
TO MEET YOUR REQUIREMENTS — Type I: Fingertip control of advance and return cylinder strokes through two push buttons. Type II: Single push button control; equivalent to spring return valve action. 3-way or 4-way types. Ideal for remote control... building into equipment. Sizes \% ", \%", and \%". For any pressure from 25 to 150 p.s.i. WRITE FOR DESCRIPTIVE LITERATURE.



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## Machine Tool Guards

By ERIC GUILBERT

Safety Director, Republic Drill & Tool Co.

(Left)
Fig. 1—Guard for single cutter attached to coolant feed pipe.

LTHOUGH considerable amount A of progress has been made during recent years in designing guards for machines, every safety man knows that he will be confronted continually with special or individual machine guarding problems. He will still have these problems if he continues to seek out trouble spots in performing his job since guarding is a basic consideration in every safety program. A safety man may often be aided in his solutions to guarding problems by men on the job. This inter-department cooperation is to be desired since it not only makes possible a speedier installation of the safety measures, but it also helps to break down the natural resistance to new developments.

Fig. 1 shows a guard recently installed over a single cutting tool. It is attached to the coolant feed pipe and is so designed that the coolant is sprayed onto the work through the guard. Therefore, if the guard is removed, the coolant will not reach the work.

Another problem of guarding was presented in designing a permanent guard to replace a removable guard on a similar machine having a gang of five cutters. Several ideas were tried until, upon a suggestion by a foreman, it was decided to apply the same principle to the gang cutter machine as that used on the single cutter. The guard installed may be seen in Fig. 2. It is welded to the coolant pipe; and it, too, is so designed that the coolant will not reach the work if the guard is removed. Another suggestion, presented by a machine operator, resulted in the further improvement of the guard. His idea was to have the back of the guard hinged to eliminate interference when removing the cutters. The improved guard is shown in Fig. 3.

Fig. 4 shows guards placed over

Fig. 2—Guard for gang cutter attached to coolant feed pipe.

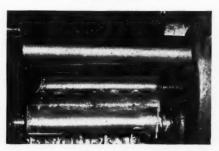


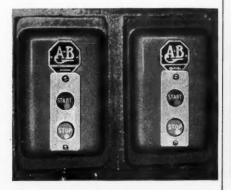


Fig. 3-Improved hinged guard for gang cutter.

start-stop buttons. These were installed after a machine was started accidentally when a tool protruding from a workman's pocket was pressed against the start button.

Although not a guarding problem, another matter for consideration was the location of drill press toggle stop switches. These were located below normal hand height, and the operators had to stoop to push the switches. Since the machines were shut down for all loading and unloading, accidents might have happened as the operators reached down. This problem was solved by attaching short extensions made of round metal rods, looped at the free

Fig. 4—Guards for start-stop switch buttons.







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The results of safety installations are not tangible. However, to safety men, a progressively decreasing accident rate is indeed heartwarming.

"The Story of Self-Luricating Bushings" is the title of an eight-page twocolor pamphlet published by the Graphite Metallizing Corp., 1050 Nepperhan Ave., Yonkers 3, N. Y., which contains complete information on "Graphalloy" Bushings that are made of solid molded graphite impregnated with molten metal such as babbitt, copper, cadmium, or silver. Standard uses for the bushings in a wide variety of industries are conveniently tabulated. Copy free upon request.

Case Histories on Coolants. Of interest to individuals concerned with the use of cutting oils and coolants is a series of case histories compiled by The F. E. Anderson Oil Co., Portland, Conn., dealing with broaching, drilling-tapping, and grinding operations performed by a number of metal-working manufacturers on a variety of materials, including several types of cast and forged steel, iron, and copper, using various cutting oils and coolants. Results are compared on the basis of production and savings. The information is grouped into three classifications (broaching, drilling-tapping, and grinding), with engineering data provided on four case histories under each heading. Copies of the case histories are available free upon request.

Chicago-Latrobe Twist Drill Catalog. A 225-page catalog covering drills, reamers, countersinks, counterbores, carbide tools, and special tools has been prepared by the Chicago-Latrobe Twist Drill Works, 411 W. Ontario St., Chicago 10, Ill. The catalog is 6 x 81/2 inches in size, is printed in yellow, red, and black, and has a plastic laminated cover which can be easily cleaned. Included are 12 die-cut tab indexes in red. The binding is of a mechanical loose-leaf type so that the pages lie flat when the catalog is opened.

Considerable space is allotted to technical and helpful facts on drills and reamers, illustrated with diagrams. An alphabetical and numerical index aid in the easy location of desired items. Copy of the catalog is available to individuals addressing requests on their company

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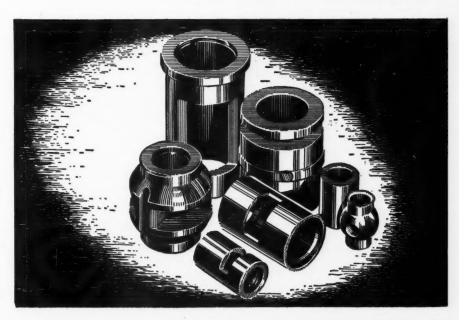
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# American Management Association Production Conference

By DON H. WIMMER

Special Correspondent

CHANGE and obsolescence, plus "getting a full day's work" out of personnel, against a background of a rising tide of preparation for defense, occupied the attention of the 1948 Fall Production Conference of the American Management Association at the Drake Hotel in Chicago, November 18 and 19.

The problem is no longer merely that of management getting along with labor. The big job is to create an atmosphere in which a fair day's labor output will be forthcoming for a fair day's pay, while faced with the waning power of financial incentives, divided allegiance on the part of employees, reluctance to give a full day's work, high absenteeism and growing problems of discipline.

Industry is again faced with an urgent request to lend some of its top management men to government agencies for two-year service in Washington. Government spokesmen promise that this will be done in a manner which will cause the least possible amount of disruption of industrial management and as far as possible without unnecessarily disturbing the

general economy of the country. The emphasis at this stage of the cold war centers upon the recruiting of industrial brains in Washington.

Coincidentally, more importance is being attached by both industry and government to the human quality of labor. Labor is not to be coddled, but more attention will be given to making the job more attractive to the worker. More emphasis will be placed on time studies with the idea of developing more or less flexible work standards. This trend is particularly noticeable in the field of materials handling, which is estimated to account for a third of the nation's payroll.

Not the least of the thinking behind the time studies of so-called "walking and handling" jobs is the attempt to set standards of cost accounting for basing unit costs of all production operations. Equally important is the necessity for setting standards of employee performance for use as a guide to the efficiency and usefulness of the individual worker on job operations heretofore more or less charged loosely to general overhead costs. All of this thinking and planning is in line with

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the attempt to arrive at a basis for a "fair day's pay for a fair day's work."

In this connection, Arthur J. Wieland, executive vice president, Willys-Overland Motors, Inc., Toledo, pointed out that "we have devised techniques, revised our procedures, changed our methods-all to improve efficiency and costs, but they are all based on the average man." He said "we must find some method of determining what this man's hopes and desires are, what manner of man he is, what makes him tick and why does he work. Without the answer to those questions and a solution to the problem after it has been identified, we are not going to solve the problems we are facing today."

In spite of the name-calling today, based on man's unwillingness to work, high pay demands, prerogatives of management and other "catch-penny" phrases, he said, we must define the problem and then break it down into units that can be accurately set forth and on which corrective action can be planned and executed. "I believe that as managers we must find methods through 'human engineering' that will:

- 1. Increase productivity.
- 2. Improve quality.
- Eliminate waste, both motion and material.
  - 4. Restore pride in workmanship.
- 5. Regenerate a belief that a man's best effort in his work is the only way to find satisfaction in that work and in his life.
- 6. Restore the dignity of work and make a good day's work a symbol of a free man's contribution to an abundant life."

As a starter at Willys-Overland, he explained, "regular monthly meetings of the supervisory staff, 500 strong, will be held. The men will be kept informed of what the company is doing, so that they will be in a good position to pass the word along down the production line. The men will be told about current costs and profits, both

by totals and by units, in terms of invested capital per man in machinery, tools and equipment."

All of which is agreed to by Erwin H. Schell, Department of Business and Engineering Administration, Massachusetts Institute of Technology, Cambridge, who warned that, "change and obsolescence are here and that the job of looking ahead is the responsibility of leadership." He spoke of the fundamental trends facing business and industry, not the least of which is the tendency to avoid difficulties rather than face them. He emphasized that the change in industrial obsolescence rates is rapidly increasing. "This is partly caused by requirements of government and partly because of demands by labor."

He said, "obsolescence does not necessarily mean loss of usefulness, but only out of date—to be replaced by something better and more useful. This trend is indicated in the increasing value which is being placed upon inventiveness and the creation of new production sequences." He said "the public is receptive to rapid changes in the introduction of new consumer items, and the smart form of safety today is to keep six months ahead of all competition."

He spoke of the changes in the usefulness of incentives. The old theory of more work, more pay, is obsolete, he contended. "It is becoming clear that incentives are losing their power, and may be classed along with the waning influence of money, caused by such things as rationing, where other pieces of paper become of more importance than money. The decline in the purchasing power of money is a factor in declining work incentive, as are the multitude of payroll deductions. Many of these ghosts still hound the factory payroll. Richness or wealth in itself is losing its importance. The world of tomorrow will place more importance on things other than money."

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January, 1949

MODERN MACHINE SHOP

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"There will be changes in the nature of executive authority. Cooperation will replace force in the production world. Fear of unemployment will be a factor in the labor field. There will be changes in industrial relationships with the public, some of it caused by election shock. The people want to see results now, because there is the atomic bomb, among other things, to cause the public to take the short-time viewpoint. All of this places business into intensive competition in order to survive under public approval and acceptance."

He warned that government wants taxes. "Labor wants its due. It's the handwriting on the wall. The cost of national security is rising. The price to be paid will rise all over the world. All of this finds its way into industrial costs. This trend is here. It is not transitory. The vast surplus of postwar machines is a factor. The increase in consumer spending is a factor in production incentive. It is management's job to make work more attractive as a means of meeting and combatting all of these factors."

Schell said, "the best hours of a worker's life are spent on his job, therefore the more attractive his job, the better his production. This is the type of incentive of the future. The acquisition of good will is now a definite management goal. Free enterprise must justify its existence through social institutions. There is nothing in the wind to stop inventiveness in the United States. We are well on the way to make industry an acceptable way of life."

Wieland concurred with the statement that this country has the manpower and resources to go ahead stronger than ever. "But we must not kill the goose that laid the golden egg. One way to build up human relations is to restore the dignity of work, and improve quality, eliminate waste and reduce prices. With lower prices the

public can buy more and thus increase the effectiveness of industry."

Floor comment on these two talks on the basis of production planning, brought out some interesting questions. In answer to a question, Schell said, "the companies doing the best job of planning are those who revise as they go along, and regard planning as a tool and not a dictum," to which Wieland added, "planning cannot be organized when the objective is better plant relations. It cannot be figured on a dollars and cents time schedule."

Other questions brought out the answer that incentives will not pull as in the past, with a strong feeling that "we have been bedeviled with pessimistic publicity based on the fear element, and there will be an effect of the impact of government on labor as a result of the election—there will be attempts to pass pro-labor laws since the Democratic Party traditionally is a labor party. But don't look for too much change. The presence of many older men in Congress is a good sign."

"You are not going to buy a car today with a thousand of your dollars. It is not in the cards now. The cost of production is up 7 per cent just in the last 60 days alone. We are close to pricing ourselves right out of the market." Wieland commented.

"There is a fourth round of pay raises just around the corner. The big industries will fall for it. The smaller companies will have to go along. We may have a few bad moments in the months to come, but I think things will work out all right. The definite trend is for management to take the reins away from union leadership, and to formulate plans to break the deadly monotony of the mass production schedules on human behavior."

In opening the Thursday afternoon session on building worker interest in production problems, L. Clayton Hill, professor of Industrial Relations, University of Michigan, said, "we haven't ase

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Detroit 1, Michigan scratched the surface in the field of human relations." He declared, "we know little of why people work and what they want."

This thought-provoking comment was carried through by Cyril J. Bath, president, The Cyril Bath Co., tool makers, Cleveland, where, according to him, good human relations are paying off. He said, "a major change is coming over the world. That change is man's adaptation to how to best use his arms and legs. Our population has increased, bringing more wants. People want more. As a result we have become specialists."

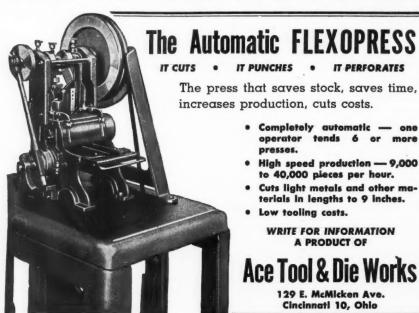
In order to build worker interest in production problems, we must realize that capitalism in reality is a cooperative enterprise. He urged that this fundamental principle be passed on to those least able to understand its workings." He said, "we think of men and women in our plant as a part of the enterprise. We keep our employees

informed of what the company is doing and hold frequent meetings to discuss current problems." He recommended getting a little closer to the men, and meet impending changes before they happen.

Bath said, "better results come from bonus plans than incentive plans, because men resent being close-timed on the job. We find close plant teamwork pays off better."

The basic principle of what constitutes a fair day's work was demonstrated by E. E. Moore, vice president, Industrial Relations, Carnegie-Illinois Steel Corp., in the film, "And In Return," which explains by actual plant examples the four steps developed for attaining a pattern for a day's work.

The film brought out the thesis that a fair day's work is that amount of work that can be produced by a qualified employee when working at a normal rate, and effectively utilizing his time where work is not restricted by



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process limitations. "A normal pace is equivalent to a man walking, without load, on smooth level ground at a rate of three miles an hour."

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Building worker interest in production problems was further discussed by Paul Startzman, general manager, Oliver Iron & Steel Corp., Pittsburgh. He said, "we must understand the simple question of why men work. We are first consumers, and second, producers. It is the responsibility of management to keep the things we use produced and distributed. In this respect, pride of achievement is as essential as the size of the pay envelope,

with the idea in mind that the customer is the sparkplug of production."

Foremen represent the fingertips of production, and management is the brain that guides the fingertips. Startzman emphasized that, "the foreman is the important man in the plant. He must know the why of his work if production is to be kept on an even keel. This calls for correlation by management and a realignment of work processes down the line. This line of action changed a growing loss in a corporation employing 5,000 persons to a gain within two and one-half months. Lagging morale caused by the previous inefficiency was changed to a definitely good morale and a consequent improvement in the quality of product."

R. F. Hurst, assistant to the vice president of manufacturing, Bigelow-Sanford Carpet Co., New York, regards quality and cost as correlated. He said "quality workmanship calls



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for less inspection, therefore lower costs and less waste. Contests and cash prizes are used to promote employee interest in quality workmanship. Reports are made periodically on costs of all scrap, waste and re-works for every supervisor. The results work out approximately like this:

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quality.

4. Our Quality Control Department is enthusiastic over their future with all this new appreciation for their problems. They're really moving in to take advantage of this selling job in a

big way."

According to Randolph W. Mallick, registered professional engineer, on temporary leave of absence from Westinghouse Electric Corp., election will have a marked effect on materials handling problems. These are high prices and the Taft-Hartley Act. This makes it important that evervone in management should become consciously aware of the fact that all manufacturing consists of only three basis operations-processing, assembling and handling. Only recently has top management begun to recognize the relative importance of materials handling and give it its rightful place in the field of management and engineering."

Mallick emphasized that, "materials handling and effective plant layout offer the greatest potential source of production economies today, with the warning that materials handling costs are steadily soaring and will go higher.

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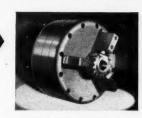
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The Materials Handling Institute of Cleveland is now making studies of materials handling costs. He believes wage incentives form a good working basis for better materials handling. This is under study now.

Management control of new product design, as described by L. J. Karmen, assistant to executive vice president, AVCO Manufacturing Corp., Cincinnati, can get out of hand unless channeled through a closely knit engineering department which will painstakingly iron out the sometimes hundreds of objections and suggestions thrown at it by the production and sales departments. This phase of new product design is handled nicely in the Crosley radio division of AVCO, by the simple device of passing along the engineering design to manufacturing "so that the problems of procurement, processing and estimating can be handled as quickly as possible." Engineering assumes the complete responsibility for

the development of a new model which will meet the sales department's specifications as to performance, appearance and cost."

"In order to get the fullest possible cooperation from all sources in the planning of new products, Crosley division works closely with outside engineers. It is planning to set up a consumer's panel in order to get advance public approval of new models. Changes in models and styles are made frequently to meet competition."

Coordinating production with sales, according to H. B. Spackman, executive vice president and general sales manager, Lyon Metal Products, Inc., Aurora, Ill., can be accomplished through the setting up of an executive committee "made up of each executive in the company, all but one of whom were officers of the company." He said, "all major problems of any kind are cleared through this committee, which is headed by the president.



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The committee system of executive management proved its worth in the war years, when product design changed frequently and sales procedure was thrown completely out of gear. The system goes a long way to remove friction in top places." Lyons also has set up a packaging committee to work with production and sales, because all of its products are packaged for shipment, involving many problems for department management.

Today, with the acute problem of raw materials, Lyon keeps going 100 per cent on its slogan of "You furnish the fuel and we will sell the product." Customer furnished steel sheet helps

out to good advantage.

On the government front, fitting in with evidence of an increasing tempo in defense preparation, Don F. Carpenter, chairman, Munitions Board of the National Military Establishment, Washington, D. C., said, "standardization of items is being given increasing top priority by government purchasing agencies." He commented that, "we don't know the status of the peace, but we must be prepared without undue alarm." He emphasized that, "preparedness is a far greater assignment now than at any time in the past."

He pointed out that, "storage piles of strategic materials are necessary. and that the millions of men needed for the armed services is a job which must be approached with the idea of not disrupting the normal economy. This is our present problem. Industry has a responsibility in this. We must have adequate preparedness without disrupting industry and the general economy. It is up to the chief military establishment to plan for allocation of the economic and material resources of the country."

He said, "it requires approximately 5,000,000 items to maintain the military establishment. We are trying to compromise the needs of the military





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establishment and the country's economy. We must inform the people of what the risks are. We must have the confidence of the people. We are studying the 'Compromise Plan' with this idea in mind."

"There is a critical shortage of skilled brains for the military establishment. We need top industrial men capable of buying \$31/2 billions of raw materials. Our problem is to counteract the fear of top rank men that they might not get back into their former jobs when the government job is completed." Carpenter, however, thinks these wanted top men can succeed in making arrangements to stay in Washington for at least one or two years. He wants these men to give this need some serious consideration and to get in immediate touch with him in Washington. He thinks the ranks need not necessarily close behind them.

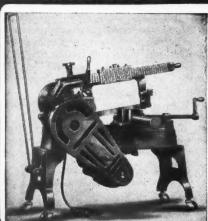
Carpenter, himself, is on leave from his job as vice-president and general manager of Remington Arms Co., Inc.

Manufacturers who would do business with the government are reminded that the Joint Chief of Staff makes the purchasing plans. He said, "the responsibility of the Munitions Board is to coordinate decisions. Actual buying is done through 19 buying agencies in the three branches of Army, Navy and Air Force. This is further broken down into 150 field offices. All requirements are presented to the resources Board for the Military Establishment. The idea is to reduce red tape and make for more efficiency. The Munitions Board does not purchase."

Carpenter urged industry members to send suggestions to the Munitions Board which have a bearing on building all purchasing operations into a better cooperative pattern, because "the next time there may not be any time to prepare. We must be as ready as possible at all times."

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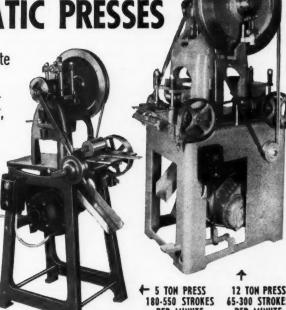
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foreman as a full partner of management is illustrated by the adoption of the Ford Motor Co. of the principle that "management must take the initiative . . . I consider that management is in charge, that management must manage, and that the test of management is whether or not it succeeds." These are the words of Henry Ford II, in his now famous speech, "The Challenge of Human Engineering," which suggested a re-evaluation of the human factor in mass production.

Archie A. Pierson, manager, Training Department, Ford Motor Co., explained that, "when management took the initiative and began the re-evaluation of the human factor in production, it recognized that machines alone "did not give us goods at low cost." Production is achieved by both machines and men. We found it necessary to establish communication with the human factor. Questionnaires were sent

to 125,000 employees in an effort to uncover their attitude toward the company and to find out if they were getting information about the company and had free access to supervisors. The secret answers were gratifying and formed a basis for establishing closer relations between employee and supervisor."

The status of the foreman under the new "human" policy is summed up in this statement: "Supervision at all levels is an integral part of management. Once a man sets foot on the management ladder in the Ford Motor Co., we want him to know our policies and programs; we want him to share our responsibilities and privileges; we want no artificial barrier put in his way if his ambition is to climb up that ladder in accordance with the value of his activities, energy or experience." Performance standards are highly prized at Ford's.

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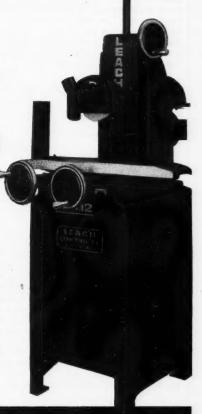
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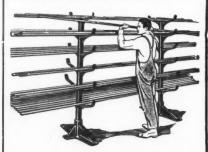
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and machinery to promote an even flow of production was described by Ned Drucker, manager of engineering, Schenley Distillers, Inc., Cincinnati, as the end result of careful realignment of space and machinery potential.

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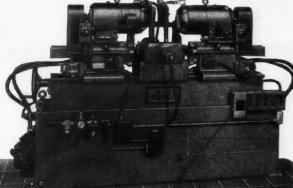
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## A Philosophy of Human Relations

The first of a series of articles in which the author clarifies some of the basic issues involved in the consideration of Human Relations problems.

By DILLARD E. BIRD

THE words "Human Relations" are probably repeated more often today in management, labor, educational, social, and religious circles than any other two words. Everywhere we go we hear people talking about Human Relations, and yet, Human Relations does not mean the same thing to all people. Rather, it is one of those coverall terms that means all things to all people. To me. Human Relations means the effectiveness of the relations existing between each supervisor in the organization and the individuals for whose supervision he is responsible. Effective relationships between first line supervision and the workers whom they supervise must be preserved at any cost.

Now, this business of Human Relations seems very simple. It is not difficult for any of us to believe, or for us to convince anyone else, that every effort should be made to make friends and stay friends with each of our associates regardless of at what level in the organization we operate. At the same time, while there is no disagreement as to the desirability of this condition, there will also be full agreement that relationships between

first line supervision and the workers whom they supervise, as well as the supervisor-worker relationships which exist at each other organizational level, are not what they should be and that the development of the right kind of relations represents a major task for most managements today.

How did we ever get into this situation? I think the story is a fairly simple one and one that bears repetition here. Human Relations had its beginning when one man employed another for the first time. The craftsman who had more work than he could do alone employed someone to assist him. This was a relatively simple relationship. The work was usually done in the home of the craftsman-employer and the worker and the craftsman came to know each other quite well.

As the size of these shops grew and intermediate layers of supervision were added, the tasks of the owner of the shop became more numerous and more complex. His responsibilities grew rapidly, all of which made it less possible for him to maintain the same kind of close relationship with each of the workers in his shop which he had formerly maintained. As more layers

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of supervision were added and the organization grew larger, particularly with the coming of the Industrial Revolution and mass production methods as we know them today, the more difficult it became for the owner to continue the relationships which he formerly had enjoyed with his men. There was so much to be done in improving the methods and technology necessary to efficient production that attention and effort were focused in this direction with a minimum of attention being given to the improvement of the employee relationships.

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The prevailing concept of those early days was that the worker was indebted to the employer for the opportunity to work. In the early days, it can be said that men lived to work. With these two principles dominating the thinking of the day, many managements did not sense the necessity of increasing their emphasis on the development of good Human Relations; many managements did not recognize the change which was taking place and drawing them continuously farther away from their employees. They had new projects to occupy their minds and attentions and they did not stop to realize that while they as individuals were becoming more important in position in the business and in the community because of the growth of their business, the workers, as individuals, were becoming less important, and in becoming less important were feeling less interest in the business than they had formerly felt and, consequently, were less productive.

Let's look at the worker and see what was happening to him while the business was growing. In the early days when the owner was the manager and his business was small, while Human Relations were comparatively simple, each workman employed was learning or plying a trade in which he could and did take pride. Each employer knew each of his employees by



Dillard E. Bird

DILLARD E. BIRD is President of Dillard E. Bird Associates, Management Consultants in Cincinnati. Several years ago, before establishing the firm which he now heads, Mr. Bird served both industry and the Government in various capacities, both in administration and as α consultant.

He taught management and Industrial Relations at the Wharton School of Finance and Commerce at the University of Pennsylvania where he took graduate work for several years. For the last five years, Bird has taught Personnel Administration and Labor Relations at the Evening College of the University of Cincinnati where he completed his Bachelor of Arts degree. He holds the degree of Master of Business Administration from the Ohio State University.

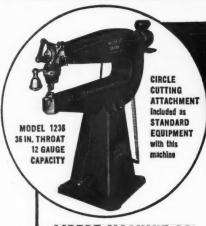
Mr. Bird has been active in the Society for the Advancement of Management for several years, serving as President of the Cincinnati Chapter in the Society year 1946-47 and as National Vice President in charge of Society Operations and Development during 1947-48 and 1948-49.

He is a native of Cincinnati where he is active in business and civic affairs. name and a close relationship was maintained, aided by a number of contributing factors and conditions; his organization was small; the community in which they lived was small; there were few interests outside the home; and pleasure lay in the social relationships in the home, in the place of work, the school, the church, and the community.

Contrast this situation with that of today. Our plants are large and are, in the main, owned by one group and managed by another. Neither the ownership group nor the management group knows the workers as individuals-each by his own name. The skill has been taken from the jobs and each task assigned to a workman has been made as simple and as repetitive as possible in the interest of greater productivity, so that so far as his skills are concerned, there is little left with which the worker's pride can be stimulated, and, there are many outside interests, activities, and amusements which also tend to distract his attention and prevent his close alliance with his employer.

We, as supervisors; as members of management, have done far too little to compensate for these changes. This omission, together with other interests which have emerged to occupy his attention and time, account for the worker's loss of interest in his job and his organization. Financial incentives have been helpful in bringing back or creating new interest in the jobs where they have effectively been installed, but they alone cannot accomplish the whole task.

It must be quite obvious by this time that the great interest and the great surge of activity in the field of Human Relations is not happenstance. The truth is that for years Human Relations problems have been accumulat-



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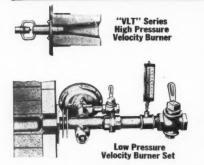
MODERN MACHINE SHOP

ing, and we have been so busy with problems which we have felt to be more directly related to production that we have postponed until "sometime when we are not so busy" our consideration of the problems relating to people. We have been telling ourselves that Human Relations problems can wait and that the other problems cannot, if we are to get out the desired production. We have accumulated so many Human Relations problems that the sheer weight of carrying them has become a major management task and each individual affected by our failure to solve one or more of these problems has become a liability to the company (to some degree) rather than an asset. This has marked a serious failure on our part-yours and mine-the failure to meet and solve Human Relations problems as we were confronted with them.

Our second principal failure, perhaps, has been our failure to recognize Human Relations problems when they presented themselves. Sometimes we have recognized them but have failed to recognize their importance. In those cases where we have recognized the problems and their importance, we have frequently had difficulty in determining their causes, and without knowing the causes, it has been difficult to develop adequate solutions. In many cases, we as supervisors, have not stopped to realize that a man works not for bread alone, but also for the satisfaction of other basic social and psychic desires and the satisfactions he expects from his job.

Thirdly, we have failed to realize that although we have developed the finest production methods and techniques in the world; unless our employees will to make those methods and techniques work, they are useless. The will to work is essential. It is often said today that while men used to live to work, they now work to live. If we

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believe the latter statement to be the case, then in this fact alone we can account for much of the decline in worker productivity which we have experienced. If this is the case, then we have a marked challenge before us. What can we do to create a greater will to work with its concomitants—pride in work, pride in accomplishment, and pride in company?

Much of the responsibility for creating the will to work rests on the individual supervisor, but before we discuss the specific things he may do, there are certain general principles which must be recognized, and which must form the basis of our thinking and planning for Human Relations if our efforts in this direction are to be successful. First of all, there must be recognition of the fact that Human Relations is a science; not an exact science, but a science nevertheless. The time has passed when we can afford to use rule-of-thumb methods or arrive at hasty conclusions which may be ill-advised. If we are to be successful in solving our Human Relations problems, the logical and scientific avenues of approach must be applied in the solution of each problem with which we are faced.

Second, we must find ways and means of restoring the dignity of man at all work stations and at all organization levels. The satisfaction of this social desire is a prime requisite if our Human Relations objectives are to be accomplished.

We must bring back values to our living. Right now, we are living in a difficult period. We are trying to run away from our problems. Today our mental attitude is inclined toward the psychology of forgetting. We can never hope to create a real sense of values in industrial relations unless we actively sponsor those activities which will add moral values to our living and offer values which will lead us into a psychology of remembering and a sta-

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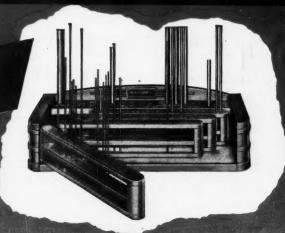
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bility reflected in a desire to remember; not the instability of wanting to forget.

Closely allied with our current spending spree on low permanent-value interests is the "something for nothing" philosophy which has been the vogue in the last decade and a half. Witness the "Give-Away" programs which fill the air lanes today. By permitting them to continue, we are creating in the minds of our youth today a "why work" philosophy and a desire to get something for nothing. It is unsound. The only way by which we can hope to get more is by giving more. The only way to increase profit and pay higher wages is through increased productivity. This same line of thinking carries into the field of happiness in that it is only through service to others that we can attain the goal of true, real, great happiness.

These objectives which we have reviewed, although general, are basic.

They are goals toward which we all must work now. They will do more to facilitate Human Relations in the individual plant and throughout the nation than any other set of factors that I know. The job of the individual supervisor will be made easier. Let's take a look at the job that the individual supervisor has to do and how he can best approach his responsibility.

If we, as supervisors, are to accomplish our purpose in the development of Human Relations, we must recognize and observe certain fundamental principles. The first principle which we must consider is that people want to cooperate. This statement may seem somewhat strange to us today in this period of troubled relations within the home, within the business, within the community, within the nation, and internationally, but strange as it may seem, this principle has a psychologically-sound basis. Now, it is very true that we do not have the kind of co-



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operation we should have today. Why is it that people do not cooperate with us as we would like to have them cooperate? It is simply because we make it difficut for people to cooperate with us and with others.

We, as supervisors and as leaders in the communities in which we live, must accept the challenge to make it easy for people to cooperate. This might be a very good time to ask ourselves how we can know how to cooperate with others. How do we know how to make it easy for the other fellow to cooperate with us and with others? It would take a lot of time and a lot of investigation before we would be able to answer these questions about any specific individual, but there are certain fundamental principles which govern our behavior and we can be pretty well guided on the right course if we keep these principles in mind.

First, every individual has the same social desires.

- a. Every individual wants social and economic security. This means that he wants to know how he is going to live, work and eat the next day and he wants to feel sure of himself in his relations with others in his home, in his business, and in his social life.
- b. Every individual has a desire for recognition for achievement. We all like to be told when we have done a good job.
- c. Every individual needs a feeling of belonging. No one wants to be on the outside looking in.
- d. Every individual has a need for purposeful activity—a job which has meaning and the purpose of which seems worthwhile.

Second, each person is an individual who wants to be recognized and treated as such.





Above: Hand-powered Type A-30 . . . up to 180° bends . . . all sizes from  $\frac{1}{2}$ " to 2". Only 7 parts. World's fastest, simplest machine. Note assortment of bending dies . . . this process makes shorter tangents than any other. Occupies only 18" x 18" floor spacel

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Third, the individual is a result of the experiences he has had in the past.

Now, if we are to think of these principles in terms of supervisory responsibility, let's consider what the individual supervisor can do to make it easy for people to cooperate with him.

 It is the job of each supervisor in his dealings with other people to help them to satisfy as many of their social desires as possible; of course, in keeping with his other responsibilities.

It is the responsibility of each supervisor to know his men as individuals and to treat them as such.

3. Since we are dealing with individuals with varying backgrounds of experience, we must remember that the method which is effective in dealing with one individual may have quite the reverse effect in dealing with others, and what may work today with one man may not work tomorrow with the same man because that individual's ideas are constantly changing.

I think that we all need to recognize that supervisory confidence begets employee confidence; supervisory performance encourages employee performance; supervisory loyalty is reflected and multiplied in employee loyalty. So it is with cooperation. Supervisory cooperation yields employee cooperation. Then this is the first lesson that we must learn and the first principle that we must follow as we approach the problem of making it easy for people to cooperate.

This idea of cooperation is not new. In fact, from the beginning of our civilization it has been a prime factor. We think of our American system of individual enterprise as being based on competition alone. I suggest that cooperation dates back just as far as does competition. The first time two people lived together, they had to co-

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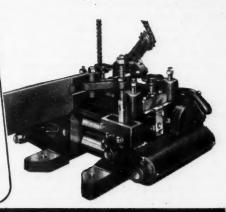
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operate if they were to survive. This was true even in our primitive economies. As economic and social relationships have become more complex, the need for increased cooperation has been intensified and all of our progress through the years can be traced to an effective blending of competition and cooperation. This, then, is the starting point for the development of effective Human Relations. This cooperation must begin at the point of first contact with the new worker.

In succeeding articles, specific ways and means by which the supervisor can create and sustain effective Human Relations within his own department will be outlined.

#### Summary

Effective relations between each supervisor in the organization and the workers for whose supervision he is

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8399 South Chicago Ave. Chicago 17, Ill. responsible are important to the success of the organization. Effective relationships between first line supervision and the workers whom they supervise must be preserved at any cost. The gradual evolution of business and industrial relationships, coupled with the changing economic and social concepts and the technological improvements which have been made, have combined to reduce the importance of the individual by reducing the amount of skill which his job requires and by making more impersonal his relationships with his management associates. We have not yet found a way to compensate for these changes which have affected the worker.

The technological advances which have been made are remarkable, but the time has now come when we must advance the science of Human Relations; we must bring along the development of Human Relations to the point attained in technological advance. We must find ways and means of creating worker-interest in the job in spite of the fact that it may be simple and repetitive. The will to work is essential. The time has passed when hit or miss methods can be relied upon to solve Human Relations problems.

The dignity of man must be restored. We must bring back values to our living. To replace our present psychology of forgetting, we must develop a psychology of remembering.

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We must discard the unsound concept of "something for nothing" which has permeated our thinking for the past decade and a half. We must create recognition of the principle that the only way to more and better things for all of us is through increased productivity and that the only way to true happiness is through service. Relating this to the job of the individual supervisor; he must recognize that people want to cooperate and must make it easy for them to cooperate with each other and with him.

Each individual has the same social desires as every other individual. He wants social and economic security. He wants recognition for achievement. He wants a feeling of belonging, and he wants to feel that his job serves a useful purpose. He wants to be recognized and treated as an individual.

The supervisor's first job is to find ways and means of assisting the worker in the satisfaction of each of these objectives. Supervisory confidence begets employee confidence; supervisory performance encourages e m plo y e e performance: supervisory lovalty is magnified in employee loyalty; and supervisory cooperation yields employee cooperation. To set a good example, then, is the first step which we, as supervisors, as management representatives, should take in our efforts to create better Human Relations, and better Human Relations are essential if the values of our American system of individual enterprise are to be preserved.

In following issues the author will devote part of his article to questions and answers on Human Relations and associated problems. Direct your questions to the Human Relations Editor, Modern Machine Shop, 431 Main Street, Cincinnati 2, Ohio.



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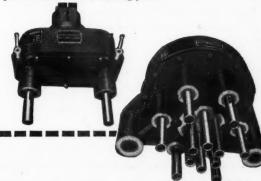
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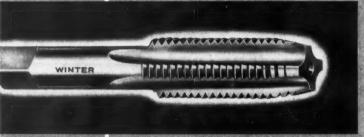
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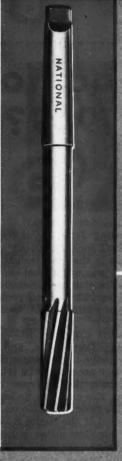
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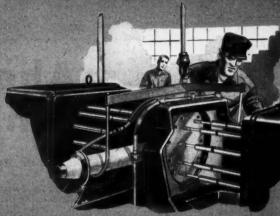
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## What's Ahead for Business in 1949?

By ADDISON B. CLOHOSEY AND WILLIAM E. JETTER

Washington Tax Bureau Research Institute of America, Inc.

WILL the change back to a Democratic Congress affect the tax situation in 1949?

Will we have an excess profits tax? Will corporate rates be increased? Will individual rates be increased?

What about operating loss carry-overs, family partnerships, Sec. 102, annuities, stock options, deductions, excise taxes, capital gains, penalties, and a lot of other things?

These are just some of the questions asked of the tax man daily, which indicate the tremendous emphasis on taxthinking brought about by the change back to a Democratic Congress. We will try to pin some of them down—to tell you what you may expect this year and next year as the result of the activity of the 81st Congress.

Tax legislative changes in 1949 could develop into policy changes and administrative changes. The latter is the Congress' term for all changes in the Internal Revenue Code which are designed to affect administration of the tax laws, plug loopholes, correct errors, right wrongs, adjust inequities, and so on.

Any policy changes will depend upon the economic situation of the country at the time when a Bill is under discussion, and upon the personnel of the Congressional Committees. Thus, if the Federal budget for the 1949 fiscal year (ending June 30, 1949) is balanced, don't look for policy changes. Our guess is that the budget for the next fiscal year will be just about within the limits of our estimated revenue for that year. This means probably no increase in rates, but no decrease either.

While the Congress will be overwhelmingly Democratic, and on the whole friendly to President Truman, this will not necessarily be true of the Committees in the Congress. They are important. For example, no legislation reaches the floor of the House without the approval of the House Rules Committee. This Committee is headed by liberal Adolph Sabath of Chicago, long an administration wheelhorse, but is otherwise composed almost entirely of Republicans and Dixiecrats. Sabath had little control over this important committee in 1945 and 1946. It remains to be seen whether he has more control this year. The Senate Finance Committee consists of seven Democrats and six Republicans, but at least three of the Democrats are of the ultra-conservative Southern variety.

Let's get down to cases on some of our questions:

1. Excess profits tax on corporations. Possible but not probable. A survey of the Senate Finance Committee reveals a probable eight votes against



Addison B. Clohosey

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Mr. Clohosey has six years of professional representation of the Research Institute of America, Washington, D. C., to his credit. In this position, he has acquired experience in Congress and government administrative agencies, enabling him to speak authoritatively about legislation and legislative prospects. Durng this period, he has also served as special tax consultant to the Department of Commerce.



William E. Jetter

Mr. Jetter is a graduate of the University of Michigan where he majored in Law and Business Administration. His business experience includes positions as securities manager for the Ann Arbor Trust Company, specialization as Tax Consultant in Texas and his most recent position, before joining the Institute staff in 1941, advisor on corporation taxes for the Carnegie-Illinois Steel Corporation.

it. That means it doesn't get to the Senate floor, and won't go to the Conference between the House and Senate. Only runaway inflation could get such a proposal out of the Finance Committee.

Increase in corporate rates. Probable if inflationary pressures continue.Not more than four percentage points.

3. Increase in personal rates. Very doubtful. Only in event budget is much higher than revenue, and then only in middle and higher brackets.

4. Excise taxes. No increase. On the other hand, we doubt that any will be dropped or decreased despite the pressures that will be brought against them. John Snyder echoed the Administration sentiment when he said, "I like excise taxes, they produce a lot of revenue." Moreover, historically, excise taxes have produced about 25 per

cent of the total revenue, and in 1947 constituted slightly less than 20 per cent, and will run at about the same rate this year.

Here are some of the things that will become completed legislation in 1949. They are in the category of administrative changes, but many of them do affect the amount of taxes you will pay:

#### Corporations

1. Net operating loss carry-over and carry-back will probably be changed from the present 2-year carry-back and 2-year carry-over to a 1-year carry-back and 5-year carry-over. This extends the "averaging" period from 5 to 7 years, and operates particularly in favor of new businesses which are seeking venture capital and have no years to which current operating

losses may be carried back.

This change could also favor individual proprietorships and partner-

ships.

2. Employee stock options will be subjected to a new set of rules. These options are incentives used by employers to attract or keep good executives by giving them a "piece of the business." The executive is given an option now to buy stock in the future at or below the present price of the stock. Under the present rule the employee (executive) receives taxable income at the time he exercises the option, to the extent of the difference between the market value and the option price. This difference is taxed as ordinary income rather than capital gain on the theory that it constitutes additional compensation for services. Under the present rule frequently the employee (executive) is called upon to sell part of the stock he receives in order to pay the tax on it. This minimizes the "piece" he receives, and to that extent eliminates the incentive the plan purposes to establish.

Under the new law where an employee is granted a stock option that (a) must be exercised within 10 years and only while he is an employee, (b) can't be transferred, and (c) the employee doesn't own more than 10 per cent of the corporation's stock:

a. Where the option price is at least 90 per cent of the fair market value of the stock no income will be recognized at the time the option is exercised. However, if the stock is sold within three years ordinary income resulting from the sale will be limited to the difference between the option price and whichever is lower between the sale price and the fair market value at the time the option was exercised.

b. Where the option price is less than 90 per cent of the market price, the employee receives ordinary income

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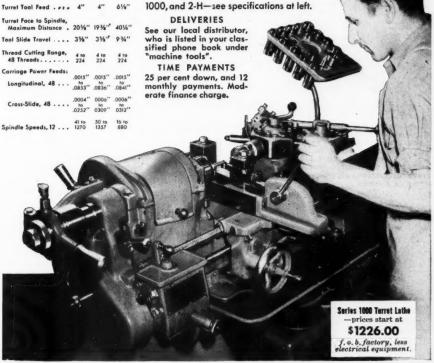
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when the option is exercised. The amount of the income will be the difference between the fair market value of the stock and the option price.

The employer will get a deduction only for the amount which is treated as fully taxable compensation to the

employee.

3. Unreasonable accumulation of surplus is subject to special surtax under Sec. 102 of the Internal Revenue Code. It will continue to be so taxed, except that the Congress will legislate that the burden of proof of unreasonableness of the accumulation will be on the Commission. Now the Corporation has to prove that any accumulation of profits is not unreasonable.

4. Taxpayers will get a break on corporate liquidations in that part of the gain on a liquidation will be deferred until non-cash assets are sold by stockholders. This will permit corporations to liquidate without stockholders paying an immediate capital gains tax on assets that have appreciated in value.

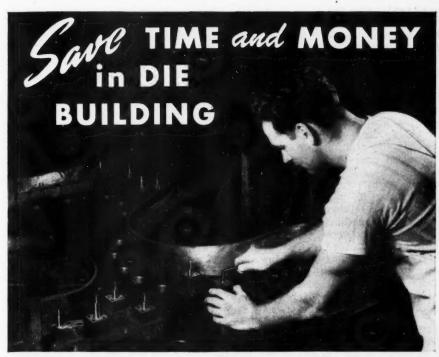
5. Corporation or individual will get a tax-free conversion where the taxpayer anticipates the receipt of the money for the involuntary conversion by purchasing similar replacement property before such receipt.

6. Would put a ceiling of 25 per cent on penalties for failure to pay withholding tax. Penalty will be computed at 5 per cent for each 30-day delay but may not go over 25 per cent. Present law has maximum of 100 per cent.

#### Individuals

1. The splitting of income between husband and wife has placed the family partnership emphasis on partnerships involving children. The new law may certify the validity of family partnerships for tax purposes, even where the partnership interest was obtained by gift. However, probably only children over 21 years of age will qualify as partners.

2. Under the present law annuities



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are taxed under the 3 per cent rule. This means that arbitrarily 3 per cent of the amount paid for the insurance is deemed to be interest, and taxable as such. Therefore, the first 3 per cent of the amount paid is taxed out of the amount received. Thereafter there is no tax on amounts received until they equal the amount paid. After that all receipts are taxable. Congress will probably change this 3 per cent rule so that the cost of the annuity be amortized over the term of the annuity, or over the life expectancy of the annuitant.

3. Taxpayers will be allowed to change an election from use of the standard deduction to the actual deduction, or vice versa, even after the return has been filed.

4. There has been a growing tendency for taxpayers to take, and the Tax Court to allow, deductions for work clothes, that approaches the limit of the ordinary worker taking de-

ductions for the cost, maintenance of his overalls. The new law will deny any deduction for wearing apparel. Safety equipment and other appliances will still be deductible as business expenses. This will still leave problems. For example, is a fireman's hat wearing apparel or safety equipment?

5. Bad debts which were originally incurred in the course of the taxpayer's business will be treated as business bad debts even though they become bad when the taxpayer is no

longer in business.

6. Wages paid to a person claimed as a dependent will not be deductible. The test of a dependent will be whether or not he has income of \$600 or more. Under present law test is \$500.

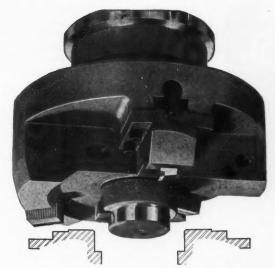
7. Nonresident alien individuals will be taxed at the rate of 30 per cent on the full excess of gains over losses. If they are in this country for less than 90 days the tax will apply only to capital gains realized during his pres-

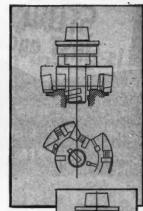


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#### Multiple Tooling

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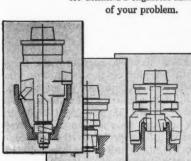
Drawings show complete tooling for a two-way, trunnion-type, fourspindle, roughing and precision boring machine, producing power takeoff units. Each tool performs one or more operations such as boring, counterboring, chamfering, facing, and hollow milling.

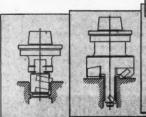
More precision parts at lower costs are made possible through specially designed inserted blade cutting tools.

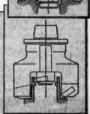
This actual example of multiple tooling recently completed by Gairing suggests how the use of sound and proven principles of cutting tool design might improve the production of your machines.

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MANUFACTURING CO. I Shear St., Binghamton, N.Y. ence in the United States. If he should be in the Country 90 days or more the tax will apply to all capital gains arising during the taxable year.

The foregoing discussion embraces some provisions that look safe for enactment. There are others that might be termed in the twilight zone. which probably will be introduced by the Treasury, but on which Congress may be unable or unwilling to do anything.

One of the more important of these relates to a very profitable use of mortgages that the Treasury would like to stop. Here's how it works, and the only way the Treasury can find to stop it is by legislation:

1. Contributions of property. You want to sell a piece of property which cost you \$20,000, but is now worth \$100,000. If you sell, there's a taxable profit of \$80,000—a long-term capital gain on which the tax would be \$20,-000 (25 per cent of \$80,000). This would give you a net return after taxes of \$80,000 (\$100,000 less \$20,000 tax).

Suppose that instead of selling, you place a mortgage of \$85,000 on the property. You then give the property to a charity, college, and so forth. You would have \$85,000 in cash on which there'd be no tax, and you could take a tax deduction for \$15,000 (the value of the property, \$100,000, less the mortgage, \$85,000). For a top bracket taxpayer, this deduction would be worth \$12,319 in tax savings. Result a return of \$97,319 instead of \$80,000.

2. Sale of property. A variation of the above can also be profitable. Suppose after placing the mortgage, you incorporate the property instead of giving it to a charity. The stock you'd receive would have a zero basis in your hands, because on a tax-free transfer of property to the corporation, the stock takes the basis of the property transferred (\$20,000), reduced by the mortgage, (\$85,000) ... and, since the rule is that a basis canTo the second

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# Best Wishes

for better filing in 1949









ALUMINUM "A" FILE. Special serratedtooth and "open-throat" cut - to prevent clogging. For aluminum and other ductile metals. Flat and Half Round, 6" to 14".

LONG ANGLE LATHE FILE. Teeth cut for clean-shearing – for fast, smooth finishing under light pressure. Made single cut on flat blanks in 6" to 14" lengths.





SUPER-SHEAR FILE. An exclusive milled curved tooth file with teeth in off-center arcs, for roughing and smoothing in one operation. Serrations break up filings. 8" to 14".

It ISN'T the cost of the file but the cost of the workman's time that counts in files and filing operations. Selecting The right file for the job is very important. Not only does it save time but it increases efficiency and reduces rejects.

Make your industrial distributor a helpful consultant on files as well as your supplier. And be sure to send for "FILE FILOSOPHY"—48 intensely interesting pages on files. Every production manager and shop foreman needs a copy.

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32 ALUNDUM abrasive is entirely different from any other abrasive—made differently by a unique Norton-developed process. There's no crushing to size—each grain forms in the electric furnace as a single, complete, multi-pointed crystal. The result is a grinding wheel that's sharper—that cuts faster and cooler.

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The grains of 32 ALUNDUM abrasive are over 99% pure fused alumina—no non-cutting slag or pores. This means grains with greater resistance to dulling—resulting in fewer wheel dressings, longer wheel life.

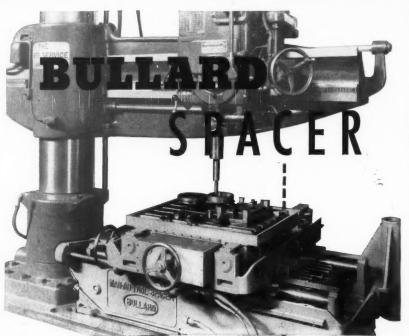
The cost-cutting ability of 32 ALUNDUM grinding wheels has been definitely proved—by steadily increasing use in thousands of plants. They can cut costs for you, too. Try them for cylindrical, centerless, surface, gear, tool and internal grinding. Ask your Norton abrasive engineer or Norton distributor for specific recommendations for your jobs.

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# **ELIMINATES . . .**Hole-Locating Jigs and Fixtures

This unit applied to radial drills having accurate drill spindles, is proving a highly successful cost reducing method for drilling short or long run jobs without the need for expensive jigs or fixtures.

It is competitively accurate and in many cases faster than conventional jig borers.

Drilling, boring, reaming and tapping operations have been speeded up and costs reduced by many users of this equipment.

To meet the future economic pressure investigate this manufacturing method. Ask BULLARD Engineers about satisfied users. Write today.

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Illustrated... 30 x 20 SPACER

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Spacer processing three different parts in one set up.

All pieces located within

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especially profitable on
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not be less than zero, the stock has a zero basis. If sometime later you sell the stock for \$15,000, your \$15,000 profit would net \$11,250 after the long-term capital gains tax of \$3,750 (25 per cent of \$15,000). You'd wind up with a total of \$96,250 (\$85,000 plus \$11,250) instead of \$80,000.

3. Incorporating property. Suppose you want to incorporate a business because that form of operation could lower the tax burden. The business has a basis of \$20,000 and a value of \$100,000. You borrow \$85,000 and transfer the property and liabilities to a corporation. The payment of the loans or mortgages by the corporation permits you in effect to draw \$85,000 of corporate profits in advance completely free of individual tax.

There is one weapon which the Treasury will undoubtedly use in attacking the *incorporation* situations, although without too much hope of success. It's a rarely used section

which provides that an otherwise taxfree exchange may be taxed where the corporation assumes a liability or takes property subject to liability if: (a) the principal purpose of the acquisition was avoiding the tax on the exchange or (b) the purpose was not a bona fide business purpose. (Sec. 112(k). But the Treasury is worried about its ability to prove the "purpose."

That is just a sample. Other fields in which the Treasury will seek Congress' help include taxes on small corporations, war loss recoveries, income of life insurance companies, pension trusts, dividends received credit, installment obligations, corporate reorganizations, personal holding companies, statute of limitations, and sundry technical matters.

We have not discussed estate tax changes because of space limitations, but there are several changes to be expected in that field.



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Whether any of these provisions become effective in 1949 is problematical. The Senate particularly does not like retroactive legislation, and our guess is that the Revenue Act of 1949 will not be enacted very early in the year. It probably will not be started until April, after which we get three or four weeks of hearings in the House: two weeks of executive sessions by the House Ways and Means Committee: two weeks to get a rule and passage by the House-and then it goes to the Senate. After passage by the Senate we'll have a Conference between House and Senate before the Bill is sent to the President for signature. When he signs it, it is completed legislation.

THE following comments on railroad progress were recently made by Mr. William T. Faricy, president of the Association of American Railroads.

"It is significant that as a result of research carried on between the two World Wars, and the investment made in improvements, the railroads were able during the second World War to carry a freight traffic load 74 per cent greater than that of the first World War and a volume of passenger traffic 100 per cent greater, and to do it without the congestion and delays of the earlier period. They did it, moreover, with one-fourth fewer men, one-third fewer locomotives, onefourth fewer freight cars and one-fourth fewer passenger cars. But these fewer cars and engines were better cars and engines. They ran on better tracks. Their movements were controlled and guided by better signals and communications. They had the use of better terminals, and were serviced in better shops. The net result was that the average freight car during World War II produced twice as much transportation per day as in the first World War.

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For Top Performance on Every Count

. It's the New, Finer **Besly "Forty-Niner"** 

Here's what's putting tap users ahead with the new high speed Besly "Forty-Niner" Taps: They're freer cutting, more accurate, longer lasting than ever before! During the past eighteen months, new specially-designed automatic machine tools and new inspection equipment have steadily revolutionized Besly Tap manufacturing to produce the world's most accurate tap - give tap users a new low in tapped hole costs.

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of gauging problems
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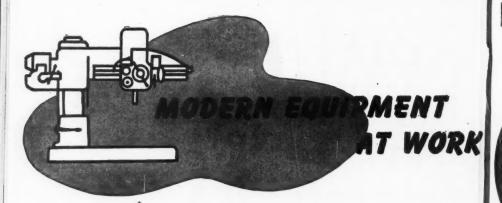
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BESLY



## Production of Ford Automobile Springs

THE parts and equipment manufacturing division of the Ford Motor Co. is manufacturing coil springs under completely mechanized conditions at its Hamilton, Ohio, plant. The plant maintains its production schedule by supplying 50,000 coil springs per week for both service and production. Approximately 650 springs are produced per hour. The installation is said to be one of the most modern and compact units of its kind in

the country; the various operations in the process are performed on both floors of a two story building.

The bar steel stock for the springs is received from freight cars on the first floor of the plant and loaded onto conveyors. Stock may be received in a precision rolled condition, or it may come in rough. An automatic handling device is provided to move the rough stock through a grinding process in order to reduce it to a proper diameter. This processed stock is combined with the precision rolled stock and carried to the second floor on an elevator type

conveyor as shown in Fig. 1.

Here, the stock is first carried through a gas-fired furnace in which the ends of the bars are heated to 1800 deg. F. in preparing them for a swag-

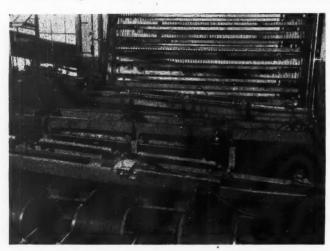


Fig. 1—Elevator type conveyor designed to carry bar stock from first to second floor. **BOYAR-SCHULTZ PROFILE GRINDERS** 



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January, 1949

2120 WALNUT STREET

CHICAGO, ILL.

MODERN MACHINE SHOP

CORPORATION

ing operation. The bars are next moved to a swaging machine in which the bar ends are tapered in a squeeze type rolling mechanism, and the parts are run through a numbering device. The bars then pass through a bar heating furnace and are heated to 1700 deg. F. in preparation for coiling. Coiling takes place as the red hot bars are fed, tapered end first, into one of three Gogan automatic coilers. As may be seen in Fig. 2, each bar is literally wrapped, in a coiler, into its final coiled shape. The coilers are manufactured by Gogan Machine Corp., Cleveland, Ohio.

The subsequent operations are those of heat treating and finishing. After the bars are coiled into spring shape, the springs are carried through an oil bath. The springs are then passed through a furnace for a normalizing process after which they are given a water shower bath. Next, the springs are cleaned and cold worked by shot



Fig. 2—Ford springs are coiled in a Gogan automatic coiler.

peening. Finally, the springs are dipped into black paint and carried through a drying oven.

The last stage of the process is that of testing. Each spring is first put through a "bulldozing" unit in which the spring is compressed to its solid height. The spring is then subjected to a weight of 1875 lb. which compresses the spring to its normal load



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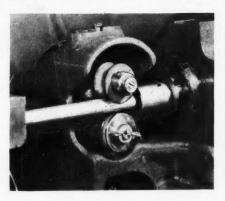
657 Route 29

Hillside, N. J.

height—9.22 inches. This normal load is a weight calculated to be the same as that which the spring will carry when it is installed in an automobile.

#### Carbide Feed Rolls in Brown and Sharpe Automatics Last Longer

SOLID carbide feed rolls designed for use in a No. 2G Brown and Sharpe automatic screw machine at



Solid carbide feed rolls in Brown and Sharpe automatic

the Carboloy Co., Inc., Detroit, have lasted, to date, more than ten times longer between reconditioning grinds than steel rolls formerly used. Two types of solid carbide rolls are used as part of the automatic feed, a V-type and a flat-type. The V-type roll is 2½ in. in diameter and 1½ in. wide. The flat-type roll is made in two sizes—2½ in. diameter x ¾ in. wide, and 2½ in. diameter x ¾ in. wide. These rolls are designed to handle bar stock ranging in size from ¾ in. to 1 in. diameter. The pressure feeding arrangement is shown in the illustration.

It was found that steel rolls had to be reconditioned after an average of 4,700 linear feet of stock had been run

Jan



#### Use AMES Horizontal Indicators

The highly accurate, highly sensitive Ames Horizontal is the right indicator for right-angle readings. It is invaluable for tool room and production jobs where it is advantageous to have the dial in a horizontal plane, and on work surfaces where the use of regular indicators is impractical.

The Ames Horizontal is designed with the usual Ames approach of sustained accuracy through simplicity. Action is obtained through a rack and pinion—there are no spirals, cams or levers which might introduce wear and incorrect dial readings. Because of its sturdy, forged brass construction, any surface of the case may be used for mounting—or the regularly supplied holding rod may be used.

Be sure you're right at right angles, specify Ames Horizontals. Write for new bulletins describing all sizes and models of this modern gauge.



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between them. Minimum time for reconditioning and setting up was one hour. The solid carbide rolls were installed a year ago, have not been reconditioned, and show no sign of wear after a total of 50,300 feet of steel rods have been run between them. Not only have more than ten hours of grinding and setting up time been saved, but the amount of spoilage which resulted when the previously used rolls started to wear has been greatly reduced.

#### "Oliver" Cut-Off Saw

cuts mouldings, tubes, strips of metal and compositions... and accurate to .005 inch!



An excellent production machine that has proved itself in leading plants of the industry. Makes straight or angle cuts with saw or cut-off wheel. Selfcontained and compact. Operates lightly with no rebound. Fully safeguarded. Cuts thousands of pieces without variation of .005 inch. Ball bearings for long service and smooth operation.

Write for Bulletin 94-DM

#### OLIVER MACHINERY CO.

Grand Rapids 2, Mich.

#### Lindberg Super Cyclone Used to Anneal Motor Laminations

A Chicago manufacturer of domestic heating equipment and quenching medium coolers has installed a Lindberg Super Cyclone to anneal rot-

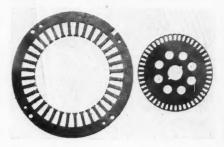


Fig. 1-Silicon rotor and stator laminations.

or and stator laminations used in the manufacture of electric motors. The laminations, as shown in Fig. 1, are made of 24 gauge silicon sheet stock. These laminations are stacked in special annealing tubes and sealed with fire clay to permit the necessary amount of oxidation. Fig. 2 shows an arrangement of approximately 30 tubes in a fixture that is to be lowered into the circular 33 inch diameter x 38 inch deep work chamber. The chamber will hold two fixtures per heat—over 44,000 laminations.

# NO BUSHINGS, GUIDES or PILOTS NEEDED!

THE READING BROACH KEYSEATER

The Reading Bench Machine requires no bushings, guides or pilots. No other machine like it. Very fast—capacity from 1/8 to 1/8 cutter.

Low first cost—prompt delivery.

READING MACHINE COMPANY, Reading (Cincinnati), Ohio



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Billings Vitalloy® Steel Heat Treated Hot Broached Really Clean Sockets Individually Inspected



There's a Billings Set for every industrial use. The component parts of Billings 318", 172" and 3,4" dires sets are specifically selected to give maximum efficiency with a minimum of pieces. Attractively packaged in sturdy, metal bases with carrying handle and snap fusteners. . . See your Billings Distributor or write for catalog.

MECHANISM DESIGN — Billings ratchet pawl meets the tooth of the ratchet wheel at a 90° angle — direct transmission of power (see diagram above).

STRENGTH — Tests have proven that the Billings safety factor will allow the ratchet to take a pull in excess of the 4800 inch pounds required by U. S. Gov. Spec. No. 41-W-10 (INT). This does not have any effect on the operating mechanism.

PERFORMANCE — A minimum of moving parts eliminates slipping, skidding and jamming. The user's effort is transmitted directly to the driver.

**WEIGHT** — One of the lightest on the market — only 18 oz., perfectly balanced for working efficiency.

MAN SIZED — Billings Ratchet handle fits the hand of the average user. The shifter, which reverses ratchet direction, is thumb sized — no broken finger nails.

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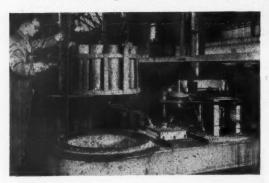


Fig. 2 — Loaded fixture is lowered into work chamber of Super Cyclone.

er Cyclone blower fans are provided to force the heated air through all parts of the charge so that the temperature in every part of the chamber is the same at any given time. The work is accomplished in a minimum floor space of 5 x 10 feet.

The laminations (2,400 lb.) plus the tubes and fixtures (800 lb.) reach annealing temperature of 1375-1450 deg. F. in 4½ hours, are held at that temperature for one hour, are cooled in the chamber for one hour, and then removed to be air cooled. Immediately after the removal, two freshly loaded fixtures are lowered into the chamber to start another annealing cycle. Sup-

## Handling and Storage of Forging Dies

A new building of all-steel construction in which specially designed steel racks have been incorporated to store dies used for forging and to trim forging has recently been completed adjacent to the forge shop at the Ft. Wayne Works of International Harv-

#### PILLOW BLOCK BALANCING WAYS

Especially suited for large diameter work, as a sub-base can be made of proper height to give necessary clearance for work. Anderson Pillow Block Balancing Ways are precision built with chilled iron discs which rotate with minimum friction on sensitive special bearings. Many manufacturers have endorsed them for profitable, efficient, static balancing.





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Write for Bulletin 1-22

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Balancing Ways, Roto Checkers, Hand and Power Scrapers,
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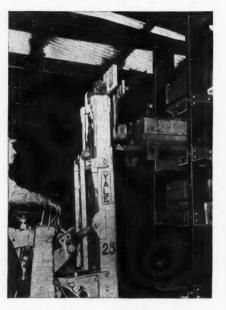
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THE GRANT MFG. & MACHINE CO. 6 Silliman Ave. Bridgeport 5, Conn ester Company. The racks are arranged along both sides of a center aisle and are made up of channel-section uprights to which the angle skidrests are riveted. The channels are welded to the roof truss beams. These features may be seen in the illustration.

Each die, which may weigh several hundred pounds, is stored in the racks



A fork truck taking a heavy forging die on its skid from a rack in the new building for die storage recently erected at International Harvester's Ft. Wayne Works

on its own skid; and, with the present arrangement, the skids are stacked five high. In all, space for 465 dies is provided.

The stacking is accomplished by the use of Yale fork trucks. Any die, on its own skid, may be moved to or from the die shop or the forge shop. When not in use, the dies are protected from the weather and do not occupy space in either the forge shop or adjacent yard.



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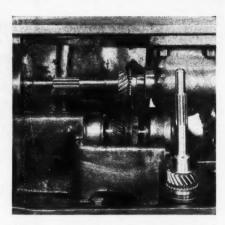
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January, 1949

#### Finishing Time on Plymouth Drive Gears is Decreased with Michigan Tool Shaver

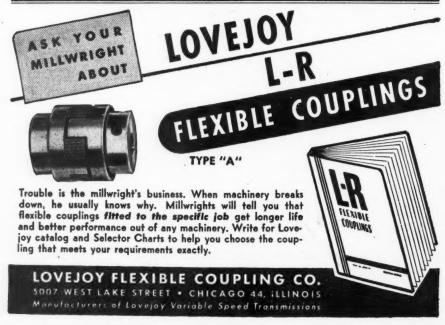
THE use of "underpass" shaving at New Process Gear Corporation, Syracuse, New York, has reduced the finishing time on helical shoulder gears for Plymouth half-ton trucks more than 50 per cent—to 32 seconds floor-to-floor time—and has lessened the overall tool cost per gear. Cutter breakage encountered with the former shaving method due to interference with shoulders has been eliminated.

The machine installed to bring about the improvement is a standard Michigan Tool Company Underpass Shaving Machine, Model 860-A. The illustration shows one of the gears in the machine. The specifications of the gear are as follows: 17 teeth with a 34 deg. left hand helix angle; diametral pitch of 7.954 in.; pressure angle of 20 deg.; pitch diameter of 2.137 in.; and made



"Underpass" shaving with Michigan 860-A Rotary Gear Shaver cuts finishing time on shoulder gears to 32 seconds

from S.A.E. 4027 steel. The machine operation is automatic except for loading; and, during the operation, between .006 to .008 in. of stock is shaved from the teeth.





Actual photo of file friction sawn on Tannewitz High Speed Band Saw. Tannewits

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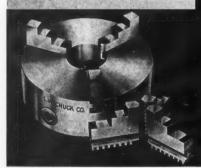




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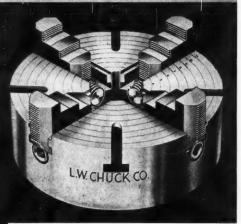
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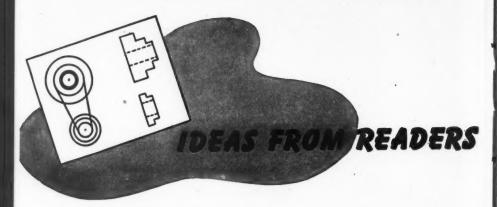
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#### Indexing Drill Jigs

By BERT CHARLESWORTH

TWO indexing jigs in which the the same principle of operation is employed have been designed recently by the author for drilling holes in plates and discs of various sizes. The smaller jig will handle work up to 8 inches in diameter, the larger jig, up to 13 inches in diameter.

Details of the smaller jig may be seen in Figs. 1, 2, and 3. The base, A, is a simple circular iron casting; and a hardened and ground tool steel center stud, B. is pressed into this base. Onto this stud are fitted a 3140 mild steel index plate, C, having 60 deg. teeth milled on its outer circumference for positioning holes at the proper angles around the workpiece; a cast iron work plate, D; a bushing, E; a washer, F; and a thumbscrew, G, to hold the work. The index plate and work plate are fastened together with four flat head machine screws. The work plate is machined on its outer rim to a 30 deg. angle; and two spring loaded pins, H, diametrically opposite, bear down on this plate to provide constant pressure for indexing. A tool steel hardened and ground index pin. I, is located equidistant between the spring loaded pins in a tool steel hardened and ground sleeve, I, which is pressed into the base. The pin in held in place by a steel compression spring, K, and a steel plug spring retainer, L, that screws into the sleeve. The pin is set accurately with respect to the exact center of the jig; and it is machined with a 60 deg. point, slightly flattened, so that it bears evenly on the sides of the tooth faces in the index plates.

A positioning mechanism for locating holes with respect to their distance from the center is provided diametrically opposite to the index pin. A hardened and ground tool steel bushing slide base, M, is fastened to the jig base with two flat head machine screws; and a rectangular slot is machined in this bushing slide to accommodate a tool steel hardened and ground bushing slide, N. The slide is held in place by a hardened and ground steel retainer plate, O, fastened to the bushing slide base with flat head machine screws. A slight indentation is provided in the center of the top of the slide over the entire length to assure a definite bearing surface for the locking screw, P; and a hole is carefully machined in one end of the slide to receive a permanent bushing, Q. Into this permanent bushing is slipped a temporary bushing, R, which varies in

Fig. 1—Plan view of eight inch diameter capacity index jig.

inside diameter and length with the sizes of holes being drilled. Two drill rod measuring pins, S, are provided for the actual measurement of radial distance. one on the end of the bushing slide and the other on the retaining plate. The pins are so placed that a micrometer reading of a distance across pins is exactly 1/2 inch greater than the distance desired from the center of the work to the centerline of the hole being

drilled. An example of this may be seen in Fig. 1. It is desired to drill holes 2¼ inches from the center of the work; therefore, the required micrometer reading across pins is 2¾ inches.

In locating a series of holes in a piece of work, the proper index plate is first placed in the jig. A set of eight index plates of different thicknesses and having different numbers of teeth spaced differently on their circumfer-

H Spring-loaded Pins bearing on 30° edge of Work Picte provide downward thrust, with just enough drag for positive indexing. Not shown in section detail.

WORK 23 ACROSS PINS N S PINS

ences was made by the writer to adapt the jig to various depths of work and angular hole locations. These plates are simple to make and may be changed easily and quickly by removing the thumbscrew, washer, work, and bushing and then unscrewing the four machine screws to remove the work plate and the index plate. The proper index plate and the other parts are then replaced in reverse order. The angular position is established by withdrawing

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the index pin, turning the thumbscrew so that the work, work plate, and index plate are rotated through the correct angle, and then allowing the index pin to drop into the proper tooth space. The radial position is established by loosening the locking screw, adjusting in the work. Since the plate is inexpensive, it is simply replaced when it becomes too scarred. Another feature is that no clamps are used to hold the work to the work plate. Instead, a thin coat of cellulose base cement is applied to the bottom of the work and the top

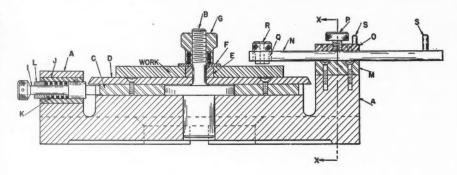


Fig. 2—Section through center of eight inch diameter capacity index jig.

the bushing slide to obtain the required micrometer reading across pins, and then tightening the locking screw. A drill may then be inserted through the bushings with the assurance that the hole being drilled is located properly. To drill the rest of the holes, the angular and radial positions are established similarly.

The work plate is of special interest. It is made of cast iron, and the work is drilled right through into this plate so that hole burrs are eliminated of the plate; and this cement not only holds the two parts rigidly, but there are no clamps to interfere with the drilling.

A half-section of the 13 inch diameter capacity jig may be seen in Fig. 4. This larger jig was designed after the smaller jig; and, although it functions on the same principle as the smaller jig, several alterations were made. The radial positioning mechanism, which is not shown in Fig. 4, is identical to that of the smaller jig with one excep-



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tion; since the bushing slide is necessarily longer and, therefore, heavier, the bushing slide base is larger—it extends beyond the outer circumference of the jig base.

As may be seen in Fig. 4, the parts are lettered similarly to those of the smaller jig with the exception of the new parts to be described. The idea of the index pin and plates was retained; but, in this case, the work, work plate, and index plate revolve with the stud when the thumbscrew is turned, instead of around the stud as in the smaller jig. The

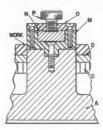


Fig. 3 — Section X-X showing bushing slide arrangement for indexing drill jig.

base, and it may be easily changed without removing the work. This is done by removing the index plate thumbscrew, U, and the index plate washer. V.

work plate is fas-

tened to the cen-

ter stud by means

of lock screws, as

may be seen; and

it rides on a sur-

face plate, T,

which is finish

ground in place.

The index plate is

concealed in the

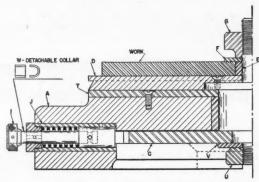


Fig. 4—Half-section of thirteen inch diameter capacity index jig.

Although the index plate cannot be seen by the operator, the indexing setup assures proper positioning. A small U-shaped detachable collar, W, is machined to fit between the index pin knob and the spring retainer. This collar is placed over the pin when it is withdrawn in order to index to a new position. The collar is made just wide enough to hold the pin out from the index plate so that the point of the pin will barely clear the index plate teeth when the plate is turned. Thus, an audible "click" is heard when the plate is turned for positioning, and a given number of "clicks" is used to indicate a certain position.

These jigs were designed because no jig borer was available, and it was found that a high degree of accuracy

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was obtained on the work being drilled and reamed. In addition, the jigs are so simple that an average, careful workman can use them—it is only necessary to count the index spaces and obtain the specified micrometer reading.

#### Portable Jig Boring Tool

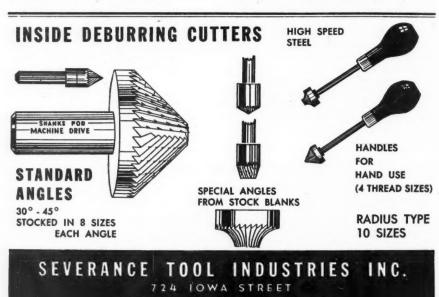
By J. B. DAVIS

Consolidated Vultee Aircraft Corporation

A PORTABLE jig boring tool has been developed by the author to expedite precision work on forgings and castings which are assembled on major airplane components. The portable unit has been used successfully for several months at Convair's Fort Worth, Texas, and San Diego, California, plants. Savings of many thousands of dollars have been realized since the first use of this tool.

Although used thus far only in the aircraft industry, the tool can be empolyed advantageously in any machine shop, tool room, jig shop, or engine repair shop. It is especially adaptable to jobs on components which are too large to be handled on stationary boring machines and to parts already installed on complete major assemblies.

The device comprises a block base having a face-normal alignment hole, a precision calibrated disc for feeding the cutting tool, a concentric boring bar with a universal drive joint at its upper end and a cutting tool insert at its lower end, and a balanced feed arm to assure correct cutting and feeding speeds for the device. Various auxiliary attachments which may be used include a drill end adaptor bar, a steppin ended bar, a boring bar with adjustable tool attachment, a pick-up bar for tooling buttons, and a set-up adaptor plate. The light-weight jig boring tool may be driven by any con-



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Fig. 1—Simple portable jig boring tool. Shown also are various precision-set cutting tool adaptors ranging from boring heads and chamlering tools to spot-facing adaptors.

ventional electric or pneumatic hand motor. The tool itself may be seen in Fig. 1. An application of the tool is shown in Fig. 2.

Before the development of the new portable unit, Convair found it necessary to locate and fasten certain workpieces and jigs on the surface tables of large standard jig boring machines. In many instances, the work involved expensive disassembly of the part from its major component in order to machine it properly. Setting up a jig borer, in icself, required many man-

hours and also tied up a machine needed in regular production work. Some jobs were too large to be set up on standard machines, and it was necessary to ship these parts to firms equipped to handle this type of work. Other jobs required the use of large jacks which involved risks of damage in handling.

The comparatively simple jig boring tool can be manufactured for approxi-

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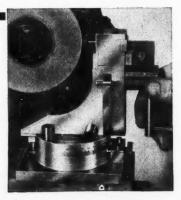
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Fig. 2 - A massive forged landing gear attachment fitting is shown being bored after its assembly to the structure of a Convair airplane. Note the conventional Chicago Pneumatic power tool employed for turning the boring bar and the offset permitted by the universal drive.

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five holes normal to a surface on a welding fixture, required less than six hours instead of the usual 150.

Small machine shops will probably find many uses for a portable jig boring tool. Where the job of disassembling units is costly, the portable tool will no doubt prove to be very useful and economical. It may be used in overhauling automobile engines for such operations as seating valves, boring for valve inserts, and re-boring cylinders.

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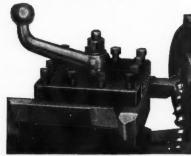
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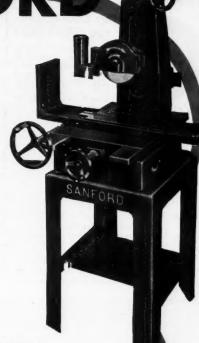
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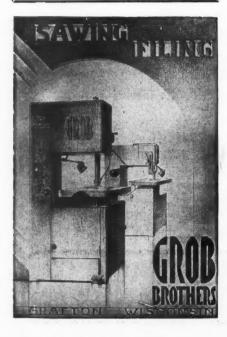
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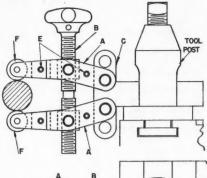
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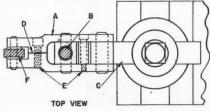


## **Balanced Knurling Tool**

By CLIFFORD T. BOWER

THE knurling tool shown in the illustration was designed recently by the author. The design resulted from the fact that previously used knurling tools were causing heavy strain and excessive wear on the bearings of a light lathe.

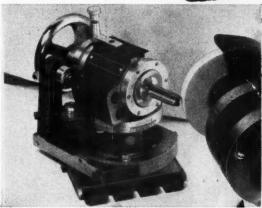




Balanced knurling tool.

The construction of the tool is simple. The principal parts are two link arms, A, which hold the knurls, a right and left hand screw, B, for positioning the link arms, and a T-shaped member, C, to which the link arms are fastened. Each link arm is split, as may be seen at D: the two parts are pinned together at E to form a link arm which is forked at both ends. A close fit is required between the link pins and the link arm sections in order to prevent any possible separation of the two sections, especially when traversing along cylindrical work. A knurl, F, is located

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in the fork space at the free end of each link arm; the fork at the opposite end is used to fasten the link arm to the T-shaped member. Two pairs of holes are drilled in this T-shaped member so that the tool may be adjusted to accommodate work up to three inches in diameter.

The tool illustrated may be used for very coarse knurling on work which is running slightly out of true with no harm to the machine. The tool, as drawn, is shown with a one inch diameter bar between the knurls; the capacity of the tool varies from zero to three inch diameter capacity.

## **A Contour Turning Method**

By ROBERT MAWSON

THE management of a machine shop was presented with a difficult machining problem when it received an order to manufacture a large quantity of machine steel cleats. The detail of the cleat is shown in Fig. 1. The turn-

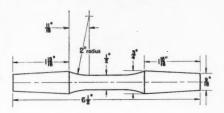


Fig. 1-Detail of a machine steel cleat.

ing of the tapered ends was a standard operation. The more difficult question was how to machine the surface between the two tapered ends.

One solution would have been to have the operator feed in the lathe turning tool, rough out an approximate shape, and then finish the surface to the proper contour with a formed

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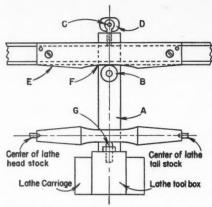


Fig. 2—Diagrammatic sketch showing essential features of the method used to produce a given contour.

tool. This method was not considered seriously since it would have been too slow for a production job and, therefore, expensive.

The machining of the parts was actually performed in a special set-up, the main features of which are shown in Fig. 2. The cross carriage feed on a standard engine lathe was disconnected by removing the feed nut. A steel arm, A, was attached at the rear of the lathe carriage; and a steel roller, B, which turned in a pin fastened through the arm was placed toward the outer end of the arm. A steel eye, C, was placed at the extreme outer end of the arm; and a steel cable, to which a weight, D, was attached, was fastened to the eye. On the rear ways of the lathe, a forming plate, E, was fastened. The plate, made of 1/4 inch ground steel, was machined as shown at F with a contour which was the same as that of the parts being machined.

In performing the machining operation, the cleat was held in the lathe between centers. With the lathe in mo-



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tion, the turning tool, G, was fed to the desired depth to obtain the % inch diameter. The longitudinal feed was then put in; and the weight, D, pulled the carriage back so that the roller, B. came in contact with the forming plate, E. Therefore, as the tool was fed along by the lathe and the roller followed the contour of the forming plate, the turning tool followed the same outline: and the desired contour was produced on the cleat.

This turning method was found to be simple, and it produced accurate results at a low machining cost.

"Program Development-A Heald Specialty" is the title of a 16-page two-color bulletin published by The Heald Machine Co., Worcester 6, Mass., which explains how Heald tackled a large-scale manufacturing program. On Page 2 of the bulletin is presented a cutaway drawing of a torque converter transmission which shows in red those parts and units which have been precision finished on Heald equipment. On the following pages, a breakdown is presented of the many operations and machines which have helped to produce this successful addition to modern motoring. Copy of bulletin free upon request.

Grobet Engravers' Tools. A 32-page catalog of engravers' tools released by the Grobet File Company of America, Inc., 421 Canal St., New York 13, N. Y., illustrates and describes the company's unusually wide line of gravers and other tools. Prefacing the various items is an interesting sketch of the history of the art of engraving. This is followed by some factual paragraphs on suitable steels for the manufacture of gravers. The catalog then mentions the various modern uses of gravers, including many uses made by the jewelry trade, watchmakers, photoengravers, diesinkers, and the artist. Besides gravers, of which nineteen styles are illustrated and listed in many sizes, the catalog also features such allied tools as steel burnishers, chisels, scrapers, scribers, needles, broaches, and burs. A page is devoted to Grobet Swiss Precision Files, and mention is made of other Grobet products, including high speed steel rotary files, countersinks, deburring files, drills, and plug gages. Copy free.

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## News of the Industry

#### Fellows Gear Shaper Executive Honored

E. W. Miller, vice president and general manager of The Fellows Gear Shaper Co., Springfield, Vt., was entertained at a dinner given in the plant cafeteria on Friday, November 5, in observance of his fifty years of service with the company. The board of directors and their wives, together with the heads of the various

departments, were present.

The highlight of the evening was the presentation of a fifty-year service pin and a morocco-bound memory book by E. J. Fullam, president of the company. The contents of this book included an etching of Mr. Miller, a biography covering his activities with the company, messages of congratulation from the heads of departments and veterans of twentyfive or more years' service with the company together with their signatures, and letters from thirty friends from all parts of this country and abroad.

In addition to the pin and book presented at the dinner, Mr. Miller received an onyx desk set from the general foreman and a gold watch and knife from

the sales and service force.

At a meeting of the board of directors of The Fellows Gear Shaper Company on Saturday, November 6, several changes in executive personnel were made. E. J. Fullam resigned as president of the company and was elected chairman of the board. E. W. Miller was elected president; R. M. Fellows, first vice president; and T. H. Gates, vice president and factory manager.

### New Welding Process Revealed by Air Reduction

The Air Reduction Sales Co., 60 E. 42nd St., New York 17, N. Y., used its exhibit at the recent National Metal Show in Philadelphia to introduce to industry a new welding process, known as the "Aircomatic," which may be used for welding heavy sections of aluminum and aluminum alloys at wire feed speeds ranging from 100 to 300 inches per minute.

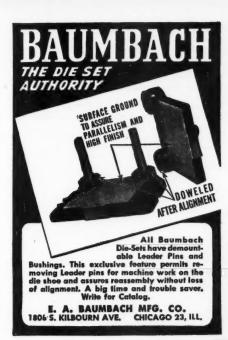
Essentially, the process is a form of gas-shielded metal arc welding, however, the conventional non-consumable electrode has been replaced by a continuously fed, consumable wire. This wire is fed

> to the work through the barrel of a welding "gun." The filler metal carries welding current, and an arc is maintained between the end of the wire and the work. Power is supplied from a standard a.c. welding genera-tor, and argon is used as the shielding gas.

> The application of the process to metals other than aluminum is now under development.



E. J. Fullam Presenting Commemoratory Book to E. W. Miller at Dinner Recently Held in Fellows Gear Shaper Plant Cafeteria



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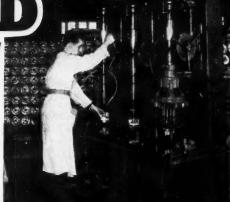
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#### Adamas Carbide Moves to Larger Quarters

As the result of a rapidly expanding volume of business, the Adamas Carbide Corporation, producer of standard and special tool tips, dies, and wear parts, has moved from Long Island City, N. Y., to Harrison, N. J. The new plant, which is located as 1000 South Fourth Street in Harrison, is more than four times larger

than the previous plant.

Included among the many modern features in the new plant are controlled temperature and humidity in powder and press rooms, more and larger presses for automatically pelleting standard shapes and pressing specials, new furnaces with electrical and optical temperature controls, and considerable other equipment helpful in maintaining quality control and high production. The Adamas business office formerly in New York City will also be located in Harrison.

#### Murco Ouarter-Century Club

At a dinner meeting sponsored recently by the D. J. Murray Co., Wausau, Wis., for members and officers with over 25 vears of service with the company, the

Murco Quarter-Century Club was organized. The following were elected officers for the ensuing year: F. C. Boice, president, and S. D. Payzer, vice president. A. W. Plier, secretary of the company, was appointed permanent secretary of the newly formed club.

Each of the veteran members was presented with a gold wrist watch and a certificate designating his years of service, the presentations being made by F. C. Boice, president of the company, who, in turn, was presented with a watch and certificate by D. C. Everest, a member of the board of directors.

> U. S.-Burke Machine Tool Company

S. Charles Straus, president, has announced the purchase by the newly formed U. S.-Burke Machine Tool Company of Cincinnati, of the patents, designs, patterns, and inventory of The Burke Machine Tool Company, formerly located at Conneaut, Ohio.

The Burke Machine Tool Company Division will continue the manufacture of the Burke line of bench type milling machines and attachments. It will also offer

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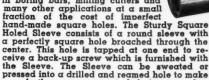
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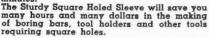
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complete parts and repair services to all present owners of Burke equipment from the new Cincinnati headquarters. Likewise, the United States Machine Tool Company Division will continue the manufacture of the United States line of hand milling machines and attachments. Thus, the newly formed U. S.-Burke Machine Tool Company will offer a coordinated and complete line of both bench type and pedestal type small milling machines. All manufacturing will be centralized in the Cincinnati plant, 16 East 72nd Street, Cincinnati 16, Ohio.

The present distribution organizations of both the Burke and United States lines will be maintained. Principals of the new U. S.-Burke Machine Tool Company are: S. Charles Straus, president; John R. Strauss, secretary and treasurer; and R.

C. Wigger, vice president.

#### Observes 25th Anniversary with Weldon Roberts

Russell S. Henderson, treasurer of the Weldon Roberts Rubber Co., 351 Sixth Ave., Newark 7, N. J., recently celebrated his 25th anniversary with the company. Throughout his years of service with the company, Mr. Henderson was closely associated with the late Weldon Roberts in the development of many new formulae and compounding processes for the internationally known Weldon Roberts erasers. He played an important part in the company's research which pio-neered the introduction of soft rubber abrasives into the metal industries for fininshing and polishing operations.

Although Mr. Henderson's work in rubber compounding constitutes a vocation, his hobby is drawing and painting for which he has a natural talent. He is also identified with philanthropic activities, chief among which is his interest in behalf of the Essex General Hospital of East Orange, N. J. He is at present a trustee of the hospital and serves on

the executive board.

### **Profit Sharing Council Reports** on Current Plans

Profit-sharing plans for employees were recently called America's best defense against totalitarianism. H. C. Nicholas, Orrville, Ohio, president of the Council of Profit Sharing Industries, told the first annual meeting of the council that profit sharing could revitalize the free enterprise system.



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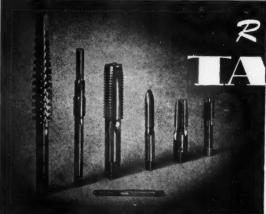
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"The council is dedicated to the task of preserving and developing the American system and to expand free enterprise into the rank of all workers in production," Mr. Nicholas said.

"Businesses which invest in profit sharing will find that it pays dividends in increased worker efficiency," he said.

The council is composed of companies that have active profit-sharing plans for their employees. More than 400 companies were represented at a two-day con-

W. H. Wheeler, Jr., president of Pitney-Bowes, Inc., Stamford, Conn., explained how his company's wage-dividend plan had made profit sharing more effective in increasing satisfaction of workers.

He said that instead of paying a bonus once a year, his company votes dividends for employees at each quarterly meeting when stockholders' dividends are considered.

"Through this close connection with stockholders' returns and frequent presentation of the profit-sharing plan in operation the company reduces labor-management friction to a minimum," Mr. Wheeler said.

William Wallace, savings executive for Sears, Roebuck, Chicago, told the

council that after 32 years of experience with profit sharing he "could not see how any company could afford to be without such a plan." He cautioned employers against mak-

ing the profit-sharing plan a substitute

for something else.

"Wages must be equal or better than those paid in related lines of industry," he said. "Paid vacations, sick allowances, and other employee benefits must equal or better competition."

He said his company has elected employee representatives, in the form of an advisory council, which meet twice a year and pool employee ideas. These ideas are forwarded to the company for consideration. No changes are ever made in profit-sharing rules without the consent and advice of the advisory board, Mr. Wallace said.

The result of such a plan is harmony between workers and employer, Mr. Wallace concluded.

### J. K. Smit Completes New Plant

J. K. Smit & Sons, Inc., producer of diamond tools, announces the completion of a new plant in Murray Hill, N. J., which will substantially increase produc-



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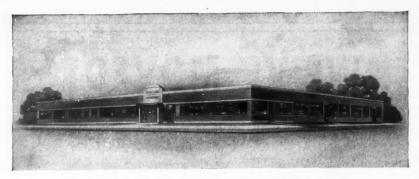
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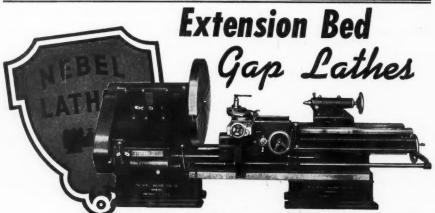
New Plant of J. K. Smit & Sons, Inc., Murray Hill, New Jersey

tion facilities and provide for better working conditions.

The first moves of the company from its present plant at 157 Chambers St., New York 7, N. Y., have already begun, and it is hoped that the entire transfer will be completed by February 15, 1949. In order to cause as little delay as possible, one department after another is being shifted to the new location. All shipments will be handled from the New York plant until further notice.

#### Society for Advancement of Management to Hold "Minute Plant" Conference

For the first time, the role of industry in possible future mobilization will be revealed at an open meeting as the nation's management men gather at the "Minute Plant" conference of the Society for Advancement of Management January 20 through 22 at The Sheraton Hotel, Chicago, according to announcement made



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by Thomas A. Sullivan, general conference chairman.

Plans for allocation of private industrial capacity, the program for military procurement, how to make the changeover to defense production with the least waste of time, money and production, will be explained by key figures in the government's industrial preparedness program and top industrialists of the na-

Production, standards and manpower problems will be thrashed out by the speakers and at question and answer panel discussions. For the first time this subject of plant mobilization will be discussed at an open meeting without invitational requirements.

"Minute Plants-Modern Minute Men," will be the theme of the combined fifth annual spring conference and second annual management exposition and show.

Typical questions to be answered include: (1) Who is eligible for "phantom" orders? (2) What preparations can be made to clarify standards and tolerances before going into production? (3) Will we have another controlled materials plan? (4) How much of our facilities shall we allot to the emergency and when?

Answers to such questions as mobilizing our physical assets, integrating our work force, measuring performance against standards, and securing cooperation through understanding are promised.

The meeting which promises to be the top management conference of the year, said Sullivan, will also look into the proposed Emergency Powers Act to be sought in the next session of Congress.

The objectives of the conference are given as increasing cooperation between private industry and government by presenting a forum for the National Security program in which

1. The government will be able to outline its plans for allocation of privately owned manufacturing capacity

2. Industry will have the opportunity to explore these plans and ask questions to clarify them in specific cases

3. Major phases of management will be discussed in the light of the above.

The "Minute Plant of 1948" will be chosen and announced at the evening banquet session on the opening day. The plant which will receive the Society for Advancement of Management Award, will be selected from plants whose management has done the most outstanding job, to date, in preparing for its part in the National Security Program.

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eral, USA, retired, consultant to National Security Resources Board, and former chief of the Chicago Ordnance district, will deliver the keynote address, "Why

Preparedness?"

Major General Patrick Timberlake, U.S.A.F., director of military requirements and facilities, of the Munitions Board, is scheduled to discuss "What Are the Requirements for National Security?" and Edward V. Hickey, coordinator of Industry Task Groups of the NSRB, will have for his topic "Mobilizing to Meet the Requirements of National Security." The three speakers will form a panel, "Programs to Solve Specific Industry Problems" for a question and answer period.

W. H. Wheeler, Jr., president of Pitney-Bowes, Inc., Stamford, Conn., will discuss "The Road to Effective Human Effort," following an introduction, "Human Beings Are Manpower" by Jack C. Staehle, director of industrial relations, Aldens, Inc., Chicago.

"Can Industry-wide Labor Relations Aid in Securing Maximum Effort?" will be the subject of James B. Carey, national secretary-treasurer, Congress of Industrial Organizations, to be followed by "A Practical Approach to Manpower Mobilization" panel consisting of James C. O'Brien, mobilization director, NSRB; Carroll French, chief of industrial rela-

tions, NAM, and Car-

At the session headed "Major Areas Requiring Attention If Minute Plants Are To Be Efficient Plants," with L. C. Morrow, editor, Factory Management and Maintenance, as chairman, the speakers will include Charles C. James, national president, S.A.M., who will discuss "Management Can and Must Measure Its Own Effectiveness," and Thomas Carley, vice president and treasurer, Reliance Manufacturing Co., Chicago, whose topic will be "Here Are Some Controls That Mean Lower Operating Costs."

Edward Jochim. plant manager, Personal Products Co., Chicago, will be chairman of the "Transforming Plans Into Action" session whose speakers include V. C. Arnspiger, executive vice president, Encyclopedia Britannica Films, Inc., Chicago, Arthur C. Horrocks, public relations counsel, Goodyear Tire and Rubber Co., Akron, and Theodore F. Lownick, Industrial Relations Counselor-who will lead a group discussion.



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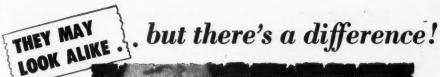
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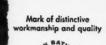
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Mark of Antonius Stradivarius, Cremona, Italy . . . 1719



While both violins may look alike to the camera's eye, one is a rare instrument . . . the other, a clever copy. Actual comparison by a trained musician will show a vast difference in quality and value!

### THERE IS A DIFFERENCE IN TAPS, TOO!

All taps may look alike at first glance, but the inherent, built-in quality of BATH ground thread taps is evident by their outstanding, everyday performance. Bath taps are ground from the solid AFTER hardening... are available in stock sizes or custom built for special uses.

For instance, if you're having "trouble tapping stainless steel, there's

a BATH tap, especially ground and engineered to speed production and decrease the threading cost of this hard-to-work metal. Why not investigate this special tap . . . or, write us about your particular threading problem today? Our experience is yours for the asking!

INSIST ON BATH TAPS . . . PROFIT BY THEIR PLUS-PERFORMANCE!

PLUG AND RING THREAD GAGES

JOHN

GROUND THREAD TAPS . INTERNAL MICROMETERS

ATH CO. INCORPORATED 20 Grafton St., Worcester, Mass.

The Lincoln Electric Co., Cleveland 1, Ohio, has announced appointments and changes in its district managers. C. W. Lytton has been made district manager for the Buffalo, New York area, with offices at 1700 Niagara St., Buffalo. C. M. Richardson has been appointed district manager for the northwestern Pennsylvania district with headquarters at 741 Liberty St., Franklin, Pa. Ray Zeh has been appointed district manager of the Toledo, Ohio district, with offices at 633 Spitzer Building, Toledo.

According to an announcmeent made by James Y. Scott, president of the Van Norman Co., Springfield, Mass., and of the Morse Twist Drill & Machine Co., New Bedford, Mass., T. W. Baush has been appointed general export sales manager of all divisions of Van Norman and also of Morse Twist Drill. Mr. Baush will have complete charge of all export business for Van Norman milling machines, ball bearing radius grinders, automotive service equipment, and special grinding machines, and the Morse line of twist drills, taps, reamers, dies, end mills and milling cutters.

THREADED LATHE CHUCKS

Mount directly on 1½,3,1,3,1,10 lethe spindle without edeprior.

UNIVERSAL MODELS 4" thru 6" INDEPENDENT MODELS 3" thru 10<sup>12</sup>

Palls for ECONOMY with PERFORMANCE

FALLS PRODUCTS, INC. 124 Genog St. Genog, III.

The Norton Co., Worcester, Mass., has announced the following changes in the personnel of its Norbide Division; John W. McCue has been transferred to the Abrasive Division training course from his territory in Chicago. George H. Powers, who has covered the New England territory, will take over the Chicago area. Sheldon V. Coleman, formerly of the sales department in Worcester, has been appointed boron carbide engineer in the district recently occupied by Mr. Powers.

The Cleveland Automatic Machine Co., Cincinnati 12, Ohio, manufacturer of a complete line of single spindle automatics and high pressure hydraulic die casting machines, has moved its New York district office, under the management of R. T. Carroll, from New York City to 1060 Broad Street, Industrial Building, Newark 2, New Jersey.

Recently, the Manhattan Rubber Division of Raybestos-Manhattan, Inc., Passaic, N. J., completed its fifty-fifth year. One of the largest manufacturers of mechanical rubber goods, the firm employs approximately 4,000 persons in a plant covering more than a million square feet of floor space.

The Porter-Cable Machine Co., Syracuse, N. Y., has announced the appointment of John A. Proven as general sales manager. Mr. Proven, who previously held the position of vice president and sales manager of the Sterling Tool Products Company of Chicago, will have charge of sales policies governing the national distribution of Porter-Cable products which include portable electric tools, floor sanding machines, and abrasive belt grinders.

The Garrett Supply Co., 3844 S. Santa Fe Ave., Los Angeles 11, Calif., has been appointed distributor in the Los Angeles area for the Butterfield Division, Union Twist Drill Co., Derby Line, Vt., manufacturer of screw plates, taps, dies, reamers, and other industrial cutting tools. In addition, the Arrow Machine Tool Co., 251 Richmond St., Providence, R. I., has been appointed exclusive distributor in Providence and vicinity for Butterfield.

J. William Jay, advertising manager of Henry Disston & Sons, Inc., Philadelphia, for the last 15 years, died of a heart attack October 29 at the age of 63 at his home, 737 Garfield Ave., Palmyra, N. J., ending a varied career of nearly half a century in advertising and allied fields.

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The Norton Co., Worcester, Mass., recently announced changes in its Abrasive Division sales force. A. W. Cox, formerly abrasive engineer in the St. Louis area, has been shifted to a newly established territory in southern California. E. H. Styffe, abrasive engineer, has moved from Pittsburgh to take over Mr. Cox's responsibility in St. Louis. Charles H. Krane, formerly field engineer in Connecticut, has been appointed abrasive engineer and will cover the territory vacated by Mr. Styffe in Pittsburgh.

The appointment of Richard W. Schreck as Michigan divisional sales representative for the Watson-Stillman Co., Roselle, N. J., has been announced by A. G. York, vice president in charge of sales. Mr. Schreck will work out of the Company's Chicago office under the direction of F. G. Helander, district manager in charge of Michigan, Mr. Schreck will act as special consultant on hydraulic machinery for two of Watson-Stillman's representatives: The Frank T. Goetz Machine Co., Cleveland, and W. K. Millholland Machinery Co., Indianapolis.

Ampco Metal, Inc., Milwaukee, Wis., has announced the addition of three distributors to handle its complete line of Ampco-Trode, Sil-Trode, Phos-Trode, and Beryl-Trode rods. They are: Allied Weld-Craft, Inc., 401 W. South St., Indianapolis, Ind.; Arizona Welding Equipment Co., 815 E. Broadway, Tucson, Ariz.; and Welder Service Co., 2037-41 Canton St., Toledo, Ohio.

Kennametal Inc., Latrobe, Pa., has announced the appointment of Carroll Edgar as a representative in the Seattle area, with headquarters at 2727 First Avenue, South. William L. Chambers, Kennametal application engineer, has been transferred from the Midwestern district to the Pittsburgh district office at 600 Grant Street. John D. Cook has been appointed as an application engineer in the Midwestern district and will work out of the Kennametal Chicago office at 9 North Jefferson Street.

Paul Hoffman, machine division district manager of Norton Company's New York offices, retired December 1 after 35 years with the company. He is succeeded by B. Harold Lewis, formerly machine sales representative for the New England area.

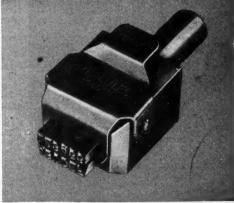
## HERCULES DOUBLE-LINE PRESS HOLDER permits instant interchanging of type!

FIRST to permit two lines of type to be changed by thumb pressure on single holding clip.

FIRST in extra quality of steel and strictly engraved "shoulder style" type.

Write for literature and prices to-





9 MORRELL STREET ELIZABETH 4, N. J.

According to an announcement made by James A. Wright, vice president and general manager of the Morse Twist Drill & Machine Co., New Bedford, Mass., John C. Kuhn has been advanced from sales manager to vice president and director of sales. A. L. Carr has been advanced from assistant sales manager to sales manager, and Stanley B. Lindh, recently engaged in the paint industry in Boston, has been named to the newly created post of sales promotion manager.

The Billings & Spencer Co., Hartford 1, Conn., maker of drop forged wrenches and shop tools, has established an emergency service warehouse at 100 S. Jefferson St., Chicago 6, Ill., from which Billings stock-carrying distributors can avail themselves of items in the event of an emergency.

A new laboratory building for metals processing studies is among the projects proposed in a \$20,000,000 development program announced recently at the Massachusetts Institute of Technology. The laboratory will be a four-story structure containing approximately 70,000 square feet.



The Hydraulic Press Mfg. Co., Mt. Gilead, Ohio, has announced the appointment of E. V. Crane, internationally known engineer in the press industry, as chief engineer.

Oscar E. Nordstrom, Norton Company machine division consultant for the Chicago territory, retired from active service December 31 after 44 years with the company.

Paul E. Butzin, active as a product and machine designer in the machine tool, electrical, and steel fabricating industries since 1916, has been appointed director of engineering for the Delta Mfg. Co., Milwaukee. Wisconsin.

The appointment of J. T. Gillespie, Jr. as sales manager of the Watson-Stillman Co., 225 Aldene Rd., Roselle, N. J., manufacturer of hydraulic presses, has been announced by A. G. York, vice president in charge of sales.

To better serve the West Coast metal finishing industry, Hammond Machinery Builders, Inc., Kalamazoo, Mich., has opened a new office at 1021 East 8th Street, Los Angeles 21, California. E. C. Hammett has been appointed western representative.

William J. McGraw, manager of electric tool sales in the New York territory, has been appointed manager of the Cleveland branch of the Independent Pneumatic Tool Co., Aurora, Ill., manufacturer of Thor portable power tools, and will be succeeded by Ed B. Rosell, electric tool service engineer in the Chicago branch territory, according to an announcement made by W. A. Nugent, Thor executive vice president.

Motch & Merryweather Machinery Co., 1213 W. Third St., Cleveland, Ohio, has been appointed distributor for Walker vertical surface grinders in Cleveland, Detroit, Pittsburgh, Cincinnati, and Dayton.

J. J. Kohl, president, International Tool Co., Dayton, Ohio, was elected president of the National Tool and Die Manufacturers Association at its annual meeting held recently in Milwaukee. Centre W. Holmberg, New York, was elected first vice president; R. H. Cope, Cleveland, second vice president; J. H. Stanek, Milwaukee, treasurer; and Alfred Reinke, Hillside, N. J., secretary. George S. Eaton, Cleveland, was reappointed executive secretary.

William P. Kirk, vice president in charge of Pratt & Whitney machine tool sales, has announced the transfer to West Hartford of James D. Allan, former manager of the P&W Cleveland office, where he will serve as manager of domestic machine tool sales under Mr. Kirk Mr. Kirk has also announced the appointment of Frank W. Schreiner to the post of Cleveland sales manager, Mr. Schreiner having been a member of the Cleveland sales staff for 21 years.

Martin C. Butters, consulting engineer, formerly connected with E. I. du Pont de Nemours & Company, has joined the staff of The O. K. Tool Co., Inc., Shelton, Conn., manufacturer of inserted blade milling cutters and single point metal cutting tools.

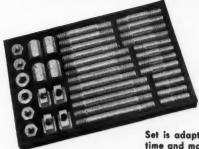
The Detroit Broach Co., Detroit 12, Mich., has announced the appointment of Henry T. Schlachter as its representative in southern Ohio and northern Kentucky, with headquarters at 426 Transportation Bldg., Cincinnati 2, Ohio. Mr. Schlachter was formerly Midwestern field manager of the Cimcool Division of The Cincinnati Milling Machine Company.

H. E. Balsiger, chief engineer, has been appointed director of engineering for the Landis Tool Co., Waynesboro, Pa., manufacturer of precision cylindrical grinding machines. Mr. Balsiger, who joined the company in 1925, will be succeeded as chief engineer by R. E. Price, formerly assistant chief engineer, who has been associated with Landis Tool since 1929. W. E. Happel, who has been with the company since 1926, has been appointed assistant chief engineer.

Lee A. Doerr, president of Electro Manchines, Inc., Cedarburg, Wis., manufacturer of electric motors, has announced the appointment of J. H. Park as sales manager. An engineering graduate of Iowa State College, Mr. Park was formerly associated with the Westinghouse Electric Corporation and has been with Electro Machines, Inc., in a sales capacity since January 1, 1948.

Congruent with the announcement of an extensive sales and production program, the Foote Bros. Gear and Machine Corp., Chicago 9, Ill., has announced the appointment of R. C. Brown as director of sales, in which capacity he will have charge of sales and promotion of all company products.

## Save Set-up Time! Cut Your Costs!



Each set has 40 pieces precision made from quality steel, case hardened for long life, hard chrome plated. Hundreds of plants use them—to profit and advantage. Investigate! Write Today! Here are the highest quality "T" Slot Nuts, Studs, Washers and Coupling Nuts you can buy – conveniently boxed—and at lowest cost! All sizes for all machines. They save machine and man hours—pay for themselves many times over.

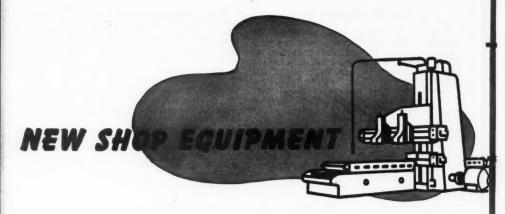
Quickly Makes Any Length

Set is adaptable, versatile. Assures rigid clamping. Save time and money with these handy, low-cost Stud and Nut Sets. Immediate delivery!

Write Today for Bulletin and Prices

NOBLE & STANTON, INC.

1006 BROADWAY . BEDFORD, OHIO



#### Cincinnati "Filmatic" Heavy Duty Traveling Table Roll Grinder

The Cincinnati "Filmatic" Heavy Duty Traveling Table Roll Grinder announced by Cincinnati Grinders Incorporated, Cincinnati 9, Ohio, is available in three swing sizes of 20, 24, and 28 inches, each in five between-center lengths as follows: 8, 10, 12, 14, and 16 feet (longer machines built to requirements).

The grinding wheel spindle operates on Filmatic bearings which are said to require no adjustment or maintenance. They are lubricated with filtered oil, pump circulated from a reservoir within the wheelhead. A pressure switch in the system closes the electrical circuit to the grinding wheel motor after the oil pressure in the bearing compartment builds up to a few pounds. Conversely, it cuts out this motor if the oil pressure should fail.

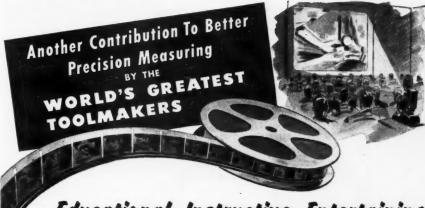
The grinding wheel spindle can be equipped with automatic balancing. When so equipped, the complete spindle

and Filmatic bearing assembly are mounted in a unit which can be rigidly clamped to the wheelhead for the grinding operation or unclamped and elastically supported on cantilever springs for the balancing operation. A raceway in the end of the spindle, accurately concentric with the axis of the journals, houses three hardened steel balls. A spring-loaded and hydraulically released plunger is provided for clamping and unclamping the balls. When the plunger is released, the balls are free to change their positions in response to the forces which act when the bearing system is unclamped and elastically supported for balancing. Conveniently located at the front of the wheelhead is a two-position lever for clamping the entire unit.

The table is traversed mechanically. Electronic controls provide an infinite range of traverse rates from 3 to 120 inches per minute. Other electrical controls accelerate and decelerate the table at reversal, eliminating shock and "coasting." Tarry at each end of the



Grinding a Steel Mill Roll on Cincinnati "Filmatic" 28 x 168-Inch Heavy Duty Roll Grinder



Educational, Instructive, Entertaining

A "MUST" FOR YOUR TRAINING PROGRAM

## THE NEW STARRETT MOVIE

"THE TOOLS AND RULES FOR PRECISION MEASURING"

#### FEATURING

- Highlights in the history of precision measuring
- New Tools and Instruments just introduced by Starrett
- Precision Measuring from basic rules to latest precision methods
- New, simplified instruction: How to use and read the Micrometer and Vernier

Here is a motion picture of vital interest to shop executives, mechanics, apprentices, vocational students — to all who play a part in modern precision production. Tells the absorbing story of precision measuring in 30 interest-packed minutes . . . how precision tools control quality in mass production . . . showing the latest methods and equipment in practical use. This inspiring, educational film will help everyone to do a better, faster job of precision measuring. It's a "must" for apprentice training and shop classes. Arrange today for a free showing to your group. Fill in the coupon. Mail it today.



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## Starrett

Standard of Precision
MECHANICS' HAND MEASURING TOOLS AND
PRECISION INSTRUMENTS: DIAL INDICATORS
STEEL TAPES: HACKSAWS AND BAND SAWS
PRECISION GROUND FLAT STOCK
Buy Through Your Distributor

## THE L. S. STARRETT COMPANY MD

Please arrange for our free showing of the new Starrett Movie
Type of Group. Size.
Name.
Position.
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City. Zone. State.

table stroke may be independently adjusted over a range of about 20 seconds.

Electrical push buttons and rheostats are grouped in a bracket at the operator's working station. These include start-stop, table traverse, table tarry, head-stock spindle speed, coolant, dynamic braking for the headstock motor, and pickfeed controls. The last four are selective "on" and "off." Controls are built into a separate floor stand panel. Included in the electrical equipment is an automatic wheel speed compensator built into the truing unit. As the truing sleeve is adjusted toward or away from the wheel,

the speed automatically increases or decreases accordingly. A jog button on the headstock facilitates setting-up operations.

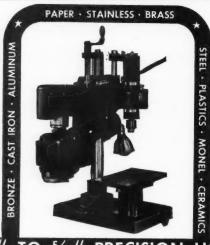
Camber or crown on the rolls is obtained through a tilting wheelhead cambering unit. The wheelhead pivots on a horizontal axis an amount controlled by the cambering unit at the rear of the machine. This unit is connected to the table traverse rack by means of a gear train which incorporates a hydraulic motor to automatically remove the backlash. An adjustable double eccentric, in combination with change gears, provides

an infinite selection of cambers within the range ordinarily required on mill rolls. A lever at the front of the machine engages the camber action.

The wheel truing unit is hydraulically powered and arranged for cam controlled profile truing. Cams can be selected to suit the camber being ground and are readily interchangeable.

Table and wheelhead ways are automatically pressure lubricated with filtered oil. The system incorporates pressure switch protection, as well as pressure gages and regulators for the individual table ways. Headstock parts are automatically lubricated by a built in pump which circulates oil to the various bearings. In addition, the footstock has a built-in reservoir for lubricating its spindle bearings.

To eliminate the physical effort of traversing the wheelhead an appreciable amount,



## 004" TO $\frac{5}{16}$ " PRECISION HOLES

## IN all DRILLABLE MATERIALS

If your job is to drill small, precision holes in hostile material try the Hamilton Varimatic Drill. It's super-sensitive; and the speed is infinitely variable between 840 and 9300 R.P.M. Clearances and travel are ample for all work of medium size. 80% of present installations are repeat orders. The reason for this popularity is built into the machine. Our Bulletin V-47 "tells all". Write for it!





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## .... for air tools and cylinders

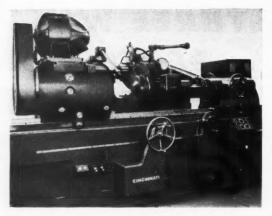
Norgren Lubro-Control Units automatically clean, control and lubricate air power . . . boost performance, cut wear and reduce maintenance in air driven tools and cylinders.

Compact, streamlined assembly of filter, regulator and lubricator, easy to install in any air line.

- filter stops all solids and eliminates moisture and oil emulsion.
- regulator accurately controls air power for smoother performance with less secondary pressure drop than conventional regulators.
- \*lubricator oils the air that drives the tool. Protects against wear while tool operates; against rust and corrosion while tool is idle.

Write for Catalog 400. C. A. Norgren Co., 222 Santa Fe Drive, Denver 9, Colorado.

Norgren



Close-Up View of Headstock, Footstock, and Operating Controls on Cincinnati "Filmatic" 28 x 168-Inch Heavy Duty Roll Grinder

#### Sibley Model D Drilling Machine

Identified as the Model D, a drilling machine with V-belt direct drive from the motor to a four-speed geared transmission which is part of the top frame assembly is now being offered in 24 and 28-inch swings by The Sibley Machine & Foundry Corp., South Bend, Ind. Ease in changing speeds is provided by an "inching" button on a fourstation switch to the front of the machine and the handy

position of the four-speed transmission

Three optional ranges of spindle speeds are available for the Model D; namely, 21 to 365, 25 to 419, and 37 to 650 r.p.m. The spindle quill bearing in the head is split and can be easily adjusted to compensate for wear. The motor is a 5 h.p.

the unit is equipped with power cross feed. This feature is engaged by a lever at the front of the machine.

Ordinarily, the machine is equipped with a set-over footstock and solid table. However, it can be equipped with a solid footstock and swivel table, gap tables, and other standard extra units.



## DETROIT POWER SCREWDRIVER CO.

2807 W. Fort St.,

Detroit 16, Mich.

N.E.M.A. Standard type for normal operations, and is said to provide ample spindle power for the recommended machine capacity of 1% inches in mild steel. The machine is equipped with electrical reversing for tapping operations.

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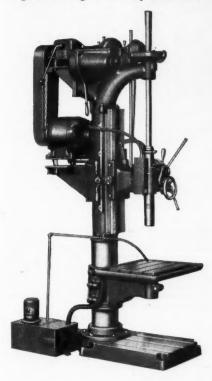
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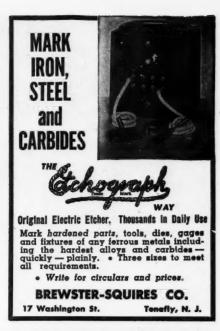
A 24-inch head travel on the column and an 11-inch spindle feed permit a wide range of drilling. The heavy table arm is



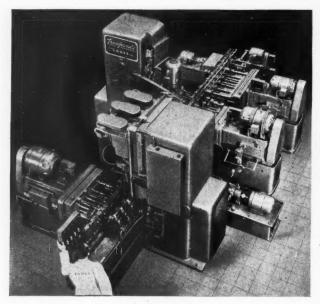
Sibley Model D Drilling Machine

said to provide for maximum strength and rigidity. The table arm and table rotate on the column, making the base easily accessible for a working surface which is heavily ribbed, machined, and provided with T-slots. The sliding surface of the column, as well as the bearing area of the head, is hand scraped to obtain accurate alignment when the head is locked at any position. The head is adjusted by a rack and pinion elevating device.

The feed mechanism is driven directly







Cross "Transfer-matic" for Gearshift Housings

from the main drive shaft through a steel feed worm and bronze worm gear. For maximum strength, the rack and pinion shaft are made in one piece from a solid bar of alloy steel. Four feed changes are obtained by a sliding shaft in the center of the handwheel. An adjustable stop collar on the graduated quill can be arranged to trip the feed at any depth.

Cross "Transfer-matic" for Gearshift Housings

A special machine tool completed by The Cross Co., 3250 Bellevue Ave., Detroit 7, Mich., is designed to simultaneously perform 14 operations on a total of 28 transmission gearshift housings. The machine is claimed to provide for a production rate of 175 pieces per hour at 80 per cent efficiency with only one operator.

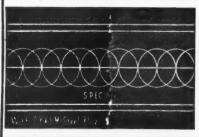
According to the manufacturer, a minimum of physical and mental effort is required on the part of the attendant in operating the "Transfermatic"—Cross' name for its special machines equipped with continuous automatic material handling devices. The operator

merely pushes the

control button and the machine takes over, automatically transferring, locating, clamping, and machining the parts progressively, two at a time. Flexibility for reasonable part changes is provided through the use of standard Cross units. The interchangeability of these self-contained units combined with the easy accessibility of wearing parts is claimed to assure low maintenance and minimum down time.

### "Truedge" Shear

The development of a shearing machine for general shop use, to be known as the "Truedge," has been announced by



## DYKEM STEEL BLUE

### Stops Lesses in Making Dies and Templates

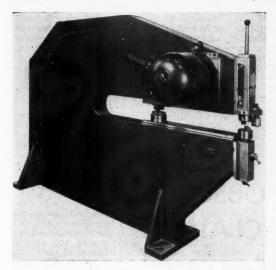
Simply brush on, right at the bench; ready for the layout in a few minutes. The dark blue background makes the scribed lines show up in sharp relief, and at the same time prevents metal glare. Increases efficiency and occuracy.

Write for full information.

#### THE DYKEM COMPANY

2301F NORTH 11th ST. ST. LOUIS, MO.

(In Canada: 2466 Dundas St., West, Toronto, Ont.)



Elge Associates, Mukwonago, Wis. According to the manufacturer, the machine utilizes a rapid shearing action which produces a continuous cut with a

finished and burr-free edge, and is designed to cut any material within its capacity such as brass, expanded metals, metal screen, stainless steel, fiber, and so on.

Material is sheared by a principle which is claimed to eliminate resistance to feeding and turning. The lower tool of the machine remains stationary while the upper tool, which is spring loaded, reciprocates vertically. Cutting speeds of from 10 to 40 feet per minute, depending upon the material, are claimed to be obtainable.

Said to cut stainless steel up to 6 U. S. gauge and mild steel up to 5 gauge, the Truedege Shear is equipped with a ¾ h.p. motor and is said to require little power to operate.

For cutting irregular shapes and small circles, curved tools are used. Circles as small as 9 inches in diameter may be cut. For straight edges and large



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## TAP BREAKAGE Reduced

Square, Straight Tapping in Haif the Time

The Dahlstrom Tap Guide practically eliminates tap breakage and saves wasted hours getting broken taps out of expensive dies. It does the job in a jiffy with work always straight and true. Just fasten it to a post or bench, slip a Tap Adaptor into the spindle, and even an inexperienced operator can handle it. Equipped with 7 Adaptors, ranging from 8-32 to ½". Taps not furnished. Nothing in your shop will pay for itself faster.

Literature on request.

Dahlstrom Manufacturing Co. 2521 Larpenteur Ave., St. Paul 8, Minn.



Dahlstrom TAP GUIDE

circles and curves, straight tools are used. The machine, it is claimed, requires only two adjustments: length of stroke and depth of penetration. The unit can be easily operated and has no tendency to self-feed and virtually no vibration, the manufacturer states. Material can be received while the machine is in operation, and no starting holes are required for inside cutting. Moreover, holes are not required to retain material on center and the changing of tools when cutting different materials is not necessary.

Ruggedly constructed with a frame of all-welded heavy steel plate, the Truedge Shear is 66 inches high x 24 inches wide x 86 inches long overall. The distance of of the cutting edge from the floor is 42 inches, and the throat depth of the machine is 51½ inches.

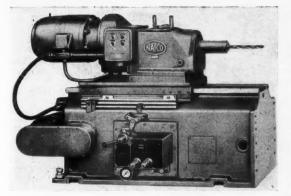
### Natco Model C "Holesteel" Floor Type Unit

Identified as the Natco Model C "Holesteel," a floor type production machine tool unit designed for use in the construction of way type machines for drilling, boring, tapping and like operations is an-

nounced by the National Automatic Tool Co., Inc., Dept. 27, Rich-mond, Ind. De-pendent upon the application and production requirements, the unit is arranged with a standard single spindle head (Model C3FT), or adjustable multiple spindle head complete with either standard adjustable spindles or slip spindle plates and spindles (Model C4FT). The electrically controlled hydraulic speed system allows for an infinitely variable feed selection within the specified range. Electrical push-button control provides for routine set-up control.

The bed is a cabinet type heavy box structure which is said to prevent deflection under the heavy thrust loads encountered. The ways are of closegrained high tensile cast iron. The cabinet section forms a compartment, enclosing hy-





Natco Model C2FT "Holesteel" Floor Type Unit

adjustment. The ways are automatically lubricated at each cycle of the slide.

The single spindle head is direct motor driven and anti-friction mounted. Sliding gears, which are lever operated, allow for a selection of seven spindle speeds within the range selected through splined pick-off gears. The gears and bearings are lubricated through a cascade system. The ball bearing mounted spindle is of a standard construction, and

the nose is provided with a Morse taper,

driving keys, and drift slot.

The adjustable spindle head is of antifriction mounted construction, in which each spindle drive has independent spindle speed changes that provide for high and low speed and neutral positions. A cascade system is employed to lubricate the head. Guide ways, of ample length, slide on the column ways and are pressure lubricated at each cycle of the head.

draulic pressure pumps and all of the hydraulic system piping. The hydraulic feed control panel is mounted on the left side of this compartment, while on the right side is located an inspection cover and a protected oil filler opening. Electric limit switches, which work in conjunction with the hydraulic panel are also located on the right side. The slide for mounting the spindle head is guided on the bed ways and is provided with gib

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# SPEED for SMALL PART ASSEMBLY

FLOORS slope to feed parts to front — end reaching and fumbling.

Bins taper toward front to form convenient semicircle—keep all bins within easy reach. Stacking, locking construction for rigid set-

ups, easily changed when necessary.

All-welded construction. Smooth, folded edges. New design, adjustable hoppers provide increased capacity and permit regulated flow of parts according to sizes and weights.

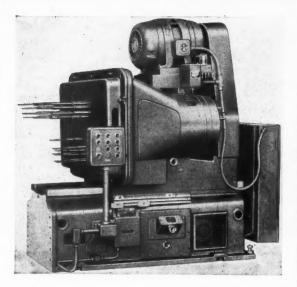
Two sizes—tapered or straight sides.



Write Stackbin Corporation, 1083 Main St., Pawtucket, R. I.
Manufactured and sold in Canada exclusively by Wickware-Stackbin, Ltd., Ottawa







A T-slotted flange on the head is used to mount both adjustable spindle arms and slip spindle plates.

The spindles are driven by universal joints of the hardened and ground solid trunnion type, and may be located in any position within the area of the head and at a drive angle of 35 degrees or less. A vertical adjustment of 2 inches is provided to compensate for tool wear or difference in length. Fine adjustment through a screw allows for facing and depth setting with accuracy.

The slip spindle plates, used in conjunction with the multiple spindle head drive, are said to be advantageous for high production small lot jobs. Several plates may be used or, in some cases, a single plate may be bored for several hole patterns. The positive location and align-

ment of the spindles is a feature of the slip spindle plate construction.

Designed for the individual requirements, the fixed center multiple spindle head is antifriction mounted where center distances will permit. A cascade lubrication system provides adequate lubrication for all bearings and gearings. Combination drilling and tapping heads are each provided with an independent reversing type motor for the tapping spindles.

The slide power cylinder is mounted between the ways and, through a control system, provides a cycle sequence of rapid advance, coarse feed, fine feed, rap-

id reverse, and stop. The control panel includes directional control, feed rate control, pressure gage, pump relief valve for pressure control, and solenoids for electrical remote control. The gasket mounting allows for installation with piping concealed within the machine and permits easy maintenance.

Two infinitely variable feed apertures control the feeds through a specified range. Working in conjunction with the feed apertures, a feed governor is said to maintain the selected feed rate regardless of fluctuations in the tool resistance, change in hydraulic pressure, or break through of the tools.

A tandem pump located within the reservoir in the cabinet base supplies fluid power for rapid traverse and feed movement. The pump is driven by a motor

TO INCREASE PRODUCTION AND TO IMPROVE EFFICIENCY USE

# **BUTTERFLY FILING AND DIE MAKING MACHINES**

This is a powerful machine for heavy or small precision work in use all over the world: Airplane Factories, Ammunition Plants, Toolrooms where fast production is desired. 4 Models, No. 16, No. 14 "EL" and Model "D." The larger the Model, the bigger the stroke and therefore more filing is performed. Furnished with or without pedestals. Constructed as per specification of U. S. Naval Aircraft Factories.

# HARVEY MFG. CORP.

161 Grand St., New York,

Phone Canal 6-5170



through V belts. The pump drive motor is located in a separate compartment within the cabinet bed in the Models C3FT and C4FT and on the rear end of the cabinet bed in the Model C2FT floor

type unit.

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Features available as extra equipment include a delayed reverse which provides a dwell at the end of the feeding stroke and is used for accurate facing-to-depth operations; a step drilling attachment which provides control for the drilling of deep holes by increments of depth with completely automatic cycle; and a remote control for set-up use which provides full remote control through push buttons for all phases of the cycle—rapid advance, coarse feed, fine feed, and rapid reverse. In connection with the set-up control, a centralized control is used for routine production cycling.

Machines built of Natco Holesteel Floor Type Units may be furnished with or without a coolant system. A motor driven coolant pump mounted on the back side of the fixture pedestal provides coolant when required. In production operation, the flow of coolant is automatically stopped except during cycling time. An independent shutoff is provided through

an electrical switch.

# Grand Rapids No. BD-1 Combination Tap and Drill Grinder

Product of the Gallmeyer & Livingston Co., 308 Straight Ave., S. W., Grand Rapids 4, Mich., the Grand Rapids No. BD-1 Combination Tap and Drill Grinder illustrated herewith has a capacity for sharpening taps from No. 6 to 11/2 inches and twist drills from 1/8 to 11/2 inches. The grinder is built around a heavy rugged one-piece column and base casting which is accurately machined to accommodate a greased-for-life precision ball bearing spindle that is driven through V-belts by an N.E.M.A. frame ball bearing motor housed within the base. The grease-packed bearings have built-in shields for the retention of lubricant and exclusion of grit and dust.

According to the manufacturer, either right or left-hand taps having 2, 3, or 4 flutes may be sharpened with equal facility on the machine, the tap holder of which may be adjusted to grind a very blunt taper such as required for bottoming taps, or an exceedingly long taper necessary for tapper taps. A diamond truing device is provided for the convenient dressing of the tap grinding wheel

of the machine.



The twist drill grinding attachment of the Grand Rapids No. BD-1 is said to be suitable for sharpening 2, 3, and 4-flute twist drills of either the straight shank or taper shank type. The only adjustment necessary when changing from the sharpening of one size of drill to another is to slide the tailstock to compensate for the difference in the length of the drills. A truing device is also provided for the dressing of the drilling grinding wheel. This device may be used without disturbing the setting of the drill holder and works in conjunction with the holder so that as the face of the drill grinding



Simply move the flexible sleeve on the taper arbor and get thousands of variations for holes from  $\frac{1}{2}$ " to  $6\frac{1}{2}$ ". Sizes are 1 to 12 with large and small sleeves for sizes 6 to 12. Write for data sheet today. Dept. M.M.

The WESTERN Tool & Mfg. Co., Springfield, Ohio



Grand Rapids No. BD-1 Combination Tap and Drill Grinder

wheel is dressed, the drill holder is automatically moved toward the wheel. In this manner, the relationship between the holder and the face of the grinding wheel is said to be constantly maintained.

#### Niagara Double-Crank Single-Geared Tie-Rod Frame Press

One of a line of newly designed all-welded straight-side presses now being offered in both single and double-crank types by the Niagara Machine & Tool Works, 637 Northland Ave., Buffalo 11, N. Y., the double-crank single-geared tierod frame press illustrated herewith has a rated capacity near bottom stroke of





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Milwaukee 4, Wisconsin

185 tons. The high speed shaft and flywheel with electro-pneumatic clutch are mounted within the crown above the crankshaft.

Bearings on each side of the backshaft pinion are said to prevent shaft deflection, thus assuring maximum gear tooth contact and reducing gear noise and wear to a minimum. The deep bed, slide, and crown are said to minimize deflection,



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Niagara Double-Crank Single-Geared Tie-Rod Frame Press

and the welded construction of the press permits a flexibility in dimensions to suit individual requirements. Use of a fiveway clutch control is optional on the machine when equipped with an electropneumatic friction clutch. By setting a selector switch, the clutch control enables the press to be operated with front and rear buttons, with front buttons alone, or with rear buttons alone, continuously or by jogging when setting the tools. A key locks the selector switch to prevent tampering.

# DORMAN TAPPER

No. 1 SIZE 3/8" STEEL

CAPACITY SOFT PLASTIC, ETC.
PRICE \$38.50 F. O. B.

Positive Non-Slip Drive. Automatic Reverse. Wide Cap. for Taps (2-56 to

Floating Chuck Jaw to prevent Tap Breakage due to missalignment.

Suitable and efficient on most Thru Hole Production Tapping Jobs.

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Put one of these low price Dorman Tappers on display for fast turnover.

3 ADDITIONAL SIZES



DORMAN MACHINE TOOL WORKS

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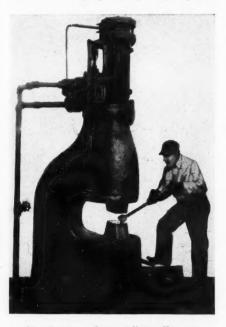
· Accuracy 1/4 Degree · Makes Duplication of Sharpening Angles Easy. Wikto Checks Drills, Cutters, etc.

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Successors to The Benton Company Dept. M. Covina, California

#### Chambersburg General Utility Hammer

According to the Chambersburg Engineering Co., Chambersburg, Pa., the greatly extended capacity range of the Chambersburg General Utility Hammer now makes available to any shop having access to steam or air lines a practical general purpose hammer for use in the economical forging of simple repair parts.



Chambersburg General Utility Hammer

Made in a range of sizes from 50 to 500 lb. falling weight, the machine is designed to handle a wide variety of jobs from tool dressing and general light blacksmithing to emergency forging of repair parts or maintenance work.

Where dies are employed, accurate work with the hammer is said to be assured by the integrated frame and anvil which are cast in one piece to prevent rocking or swaying. Additional features of the machine include an automatically lubricated power-saving cylinder; heattreated, ground face, alloy forged steel flat dies which are said to make work manipulation easy and enable the hammer to forge the tougher steels with a

Gray Adjustable-Convertible Openside Planer

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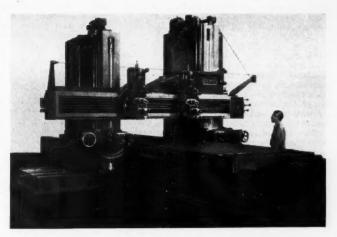
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minimum number of redressings; induction hardened piston rings with long wearing qualities; and self-seating rotary type valve directly connected to the throttle control, thereby providing for maximum air or steam efficiency.



# Gray Adjustable-Convertible Openside Planer

Unusual versatility is said to characterize the Gray Adjustable Convertible Openside Planer introduced by The G. A. Gray Co., 3603 Woodburn Ave., Cincinnati, Ohio. Manual or power in-and-out

adjustment of the outboard housing provides for effective utilization of the left-hand side head. Jobs of unusual width may be accommodated by the removal of the outboard housing. This housing is mounted on a wide runway which is secured to the main bed. For main bearing surfaces are provided against which the



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# HARTFORD SUPER-SPACER

# for JIG BORING WORK

Here the Super-Spacer is demonstrating another of its advantages to any tool room. Equipped with a face plate for exact location of work, it can be used on your jig borer to save indexing time, and production cost per piece. The Super-Spacer takes milling, drilling, grinding, planing, slotting, boring and other operations in stride. Investigate its benefits to your shop. Write Dept. S-6.



THE HARTFORD SPECIAL MACHINERY CO. HARTFORD 5, CONN. housing may be firmly locked. A oneshot pressure oiling system is said to assure complete lubrication of the run-

way bearings.

Unusual rigidity is obtained through clamping of the rail to the housing as well as the knee to the main column. Both power-operated clamps are automatic and synchronized. The left-hand side head is actuated by a self-contained rapid traverse system, and its feed and automatic tool lifter mechanisms are connected with the main systems.

The Gray Adjustable-Convertible Openside Planer is available with table speeds up to 300 feet per minute and may be equipped with Gray Non-Metallic Table Ways and Space Saver Drive. Loop lubrication and full-floating drive shaft are standard equipment.

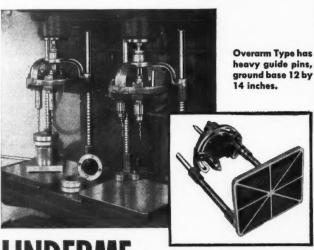
#### Snyder Special Facing and Center Drilling Machine

A special-purpose machine built by the Snyder Tool & Engineering Co., 3400 E. Lafayette Ave., Detroit 7, Mich., is designed to face and center drill the ends

of crankshaft forgings at the rate of 47 pieces per hour at 80 per cent efficiency.

In operation, the forging is located in the holding fixture manually and held by means of hydraulically actuated clamps. When the cycle button is pressed, the fixture table advances rapidly toward the milling cutters and drops into feed, with both ends of the forging being faced to the correct overall length. The inserted carbide milling cutters are located on spindles that are Timken-bearing mounted, and are operated at a speed of 350 feet per minute.

Following the completion of the facing operation, the fixture table returns to the centering position, and hydraulically actuated quills carryin the centering tool spindles advance and drill centers in both ends of the forging. The centering drills are made of high speed steel and operate at a speed of 60 feet per minute.



# LINDERME 2-Spindle Head

"increased production from 160 to 600 an hour"

This story is typical of the many applications of Linderme 2-spindle drill heads on long and short runs. You'll like these features: drills, taps—in metal, wood, plastics; quick, accurate adjustment, ½" to 6" centers; two minute set-up on most drill presses in

your shop; anti-friction bearings, rugged gearing, quality machining—and Linderme's low initial cost for Overarm or Sleeve Types—Twelve models, capacities up to 1/8", available with G.M. Sleeves or Morse Tapers. Write for complete catalog.

LINDERME MACHINE AND TOOL CO., INC.

12247 COYLE AVE. . DETROIT 27, MICH.

SNYDER

Snyder Special Facing and Center Drilling Machine

gle 15 h.p. motor. The base of the machine is of welded steel construction, thoroughly normalized and ribbed for rigidity. The coolant tank is separate. The machine which requires a floor space of 108 x 70 inches, has a fully automatic work cycle, thus enabling it to be operated by unskilled labor, it is claimed.

"Lapmaster" High Production Lapping Machine

The Snyder Special Facing and Center Drilling Machine is adaptable to a wide range of part lengths and is fully adjustable as to speeds and feed. The stroke can be adjusted from 8 to 12 inches. The drive is effected through belting and helical gears, and power is supplied by a sin-

Precision lapping under severe production schedules is said to be possible with a high production lapping machine, known as the "Lapmaster," developed by the Crane Packing Co., 1800 Cuyler Ave., Chicago 13, Ill. The machine is applicable to production runs or individual



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jobs and can be operated by unskilled workmen. Work handled in one operation may be of different sizes, shapes, and

heights.

The Lapmaster embodies a continuously agitated compound tank, an alloy-iron lapping plate driven by a gear reduction motor, and combined work holders and wear rings which are held in place by adjustable bars. The lapping cycle time is automatically controlled by a clock which provides for stopping of the lapping plate and closing of the compound valve at the end of a predetermined period. An outstanding feature of the machine is the

"Lapmaster" High Production Lapping
Machine

# T. H. LEWTHWAITE MACHINE CO.

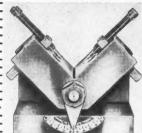
FRONT LEVER BENCH PUNCH

Capacity 7/16" hole through 1/4" steel or equal

Round, square, flat, and avail shaped punches and dies stocked

Send for circular illustrating and describing this machine. 317 East 47th St., New York 17

SWIVEL CLAMPING BLOCK



1. Swivel 90 degrees from center on both sides.

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3. Working surfaces up to  $3\frac{1}{2}$ " x  $5\frac{1}{2}$ ". 4. Bases up to 15" x 5".

Available without bases and in other styles.

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Machine Tool Accessories
53 Park Place N. Y. C. 7, N. Y.

continuous self-conditioning of the lapping plate which is said to afford controlled and continuous accuracy in flat concave and convex lapping up to 0.000016 inch. Micro-inch finishes of 1 to 3 r.m.s. are claimed to be easily obtained.

After the work to be lapped has been placed in the work holders, the machine is started by turning on the switches to the lapping plate motor and to the compound agitator. When the lapping plate motor is started, the solenoid compound valve opens, thus allowing the compound to run down the feed wire to the lapping plate where it is evenly distributed to the surface by the rotation of the work holders. The wear rings and work holders rotate within their own orbit on the



# M - D Facing Heads

Can be attached to Boring Mill Bar, and Drilling or Milling Machine spindles. Single point tool travels radially, from center outward or reverse; feeds automatically. Sizes 6" to 46" diameter.

Write for circular.

MUMMERT - DIXON CO.

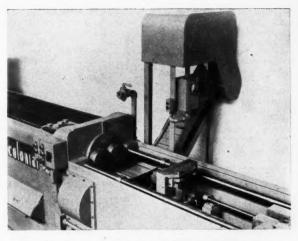
120 PHILADELPHIA ST. HANOVER, PA.

Colonial Universal Horizontal Broaching Machine Equipped with Automatic Broach Handling Mechanism and Parts Ejector Conveyor

face of the lap, which rotates under the work, as do the wear rings. The work, in turn, is free to rotate on its own axis in the work holders. This free motion of the work generates a uniform abrading action which is said to be essential in order to produce uniform concave, convex, or flat lapping to extremely close specified tolerances.

The Model 12 Lapmaster shown herewith is equipped with a 12-inch lapping plate and three wear rings, each with an internal capacity of 41/4 inches. This model is one of seven models to be made available with lapping plates of 12, 18,

24, 36, 42, 48, or 72 inches.



# Colonial Universal Horizontal **Broaching Machine**

Designed to increase production and, at the same time, reduce operator fatigue to a minimum, a universal horizontal broaching machine featuring an auto-



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# Top Rim STEEL STACKING BOXES 18" x 12" x 6". 16 Ga. with Drop Handles

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We make a specialty of boxes made to fit your particular handling requirements. Special boxes designed so they can be run thru with standards enable us to quote prices comparable with that of a standard box.

FACTORY EQUIPMENT CO

183 CHARLES ST. PROVIDENCE, R. L



Reishauer Type ZA Gear Grinding Machine

veyor, and the broaches then return to position for reloading. The broaches themselves are not shown in the illustration, having been removed to better illustrate the automatic broach handling mechanism.

#### Reishauer Type ZA Gear Grinding Machine

Designed to grind precision gears at an extremely high production rate, the Reishauer Type ZA Gear Grinding Machine shown herewith is now being marketed by the

being marketed by the Cosa Corp., 405 Lexington Ave., New York 17, N. Y. As a grinding tool, a single-thread grinding worm with rack is employed which generates the theoretical shape of the tooth by means of an infinite number of enveloping cuts. The machine is said to be suitable for grinding spur gears and helical gears with a diameter up to 9½ inches and a pitch up to DP 6. Due to the high production capacity of the machine, gears with pitches below DP 32 can also be economically ground from the solid blank, it is stated.

The grinding process employed by the Reishauer Type ZA Gear Grinding Machine is continuous, with the machine working automatically to the finished dimensions within very close tolerances. The horizontally arranged grinding slide of the unit performs the wheel feed

matic broach handling mechanism and parts ejector conveyor interlocked with the machine cycle has been developed by the Colonial Broach Co., Box 37, Harper Station, Detroit 13, Michigan.

The operation for which the machine is equipped is the simultaneous broaching of two universal joint yokes. The broach handling mechanism eliminates handling of broaches by the operator who merely places the parts to be broached over the pilot ends of the broaches which then carry the parts with them into broaching position against the faceplates, as shown in the accompanying illustration. The broaches are automatically engaged by broach pullers and are pulled through the parts. After the broaching operation has been completed, the finished parts drop off the ends of the broaches onto the con-

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We know our equipment.

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Automatics—25%" Rd. capacity, Turret Lathes—3" Rd. capacity. Castings and Forgings machined to a maximum diameter of 10", length 8", weight 15 lbs.

We are also equipped for Milling, Drilling, Threading and Tapping. May we quote?

# SCREW MACHINE SPECIALTY CO.

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Pittsburgh 1, Pa.

movements and supports the attachment for profiling the grinding worm. The vertically adjustable work slide guides the rotating workpiece, located between two centers, past the grinding worm. To set straight toothed workpieces into the helix angle of the grinding worm and to grind helical gears, the vertical slide can be swiveled in both directions up to an angle of 45 degrees.

A 3.5 h.p. synchronous motor is used to drive the grinding worm of the machine, which is controlled by a hydraulic-electric system. The various control movements are started electrically and

effected by means of oil pressure. All control elements are arranged in a convenient position on the front of the machine.

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The Reishauer Type ZA Gear Grinding Machine has a capacity for gears from 1/2 to 91/2 inches in diameter and can be used in producing any number of gear teeth from 12 to 130. A crushing device. diamond truing device, outer diameter dressing device, center grinding attachment, balancing ways, and diamond lapping device are available as special equipment for the machine.

# Hydraulic Turret Press

Especially adaptable to short runs where a schedule per day, week, or month is required, a hydraulic turret press with rotating table which is designed to accommodate as many setups as will fill

the table has been announced by the Universal Air-Line-Joint Mfg. Co., Lafayette, Ind. After the initial mounting of fixtures on the table, the operator can readily change from one fixture to another for performing blanking, forming, drawing, swedging, assembling, and other operations.

The press, frame, and turret table are fabricated of steel. The turret table is mounted on rollers and is designed for rotating manually. Heavy hydraulic tubing and flare type fittings are used. The hydraulic pump is self-contained.

The press is equipped with an easy-to-

# Air Operated ROTARY WORK FEEDER



Deftly holds and delivers small parts to drill, tap, swage, stake, etc. Stations accurate to .002". Guaranteed against over-travel or "skipping." Indexes as slow or fast as you like, up to 10,000 per hour. Compact and sturdy, easy to tool and hook up.

Standard dial plate 10"; available in 12". For a new job, simply tool up a new dial. Readily combines with "MEAD-MATIC" Timer, Air Hammer, Air Press, Drill Presses, etc.—to make almost completely automatic machine—operator merely loads. Write for full details.



read load gage, electric limit control, electric overload control, magnetic power valve submerged in oil, magnetic pushbutton starter, and Neoprene insulated electric wiring. It is driven through V-pulleys and V-belts. Designed for operation either automatically or manually, the hydraulic turret press is made in three sizes: No. 10, 20,000-lb. ram load, available in three models with from 4,740 9,400 strokes per hour; No. 20, 40,000-lb. ram load, available in three models with from 4,080 to 8,200 strokes per hour; and No. 30, 60,000-lb ram load, 3,600 strokes per hour.

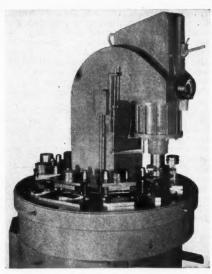




This new, streamlined bench type grinder assures fast, quality finishing on metals, plastics, wood, fibre . . . at low cost. Built to machine tool specifications, Standard D-4 is equipped with improved band tension control and specially designed protective motor hood. 4x361/4" band. The ideal portable unit.

OTHER STYLES AND SIZES IN NEW MANUAL ON FINISHING—WRITE TODAY

WALLS SALES CORP.



**Hydraulic Turret Press** 

Specifications of the machine are as follows: turret table, 48-inch O.D. and 20-inch I.D.; ram stroke, 4½ inches maximum and ½ inch minimum; distance turret table to ram, 10½ inches maximum and 6½ inches minimum; slug clearance hole in bolster plate, 4½ x 4½ inches; base, 38 x 32 inches; projected floor space, 48 x 56 inches; distance of turret table from floor, 37½ inches; overall machine height, 83½ inches.

# Schmidt Car Frame Numberer

Product of Geo. T. Schmidt, Inc., 1806 W. Belle Plaine Ave., Chicago 13, Ill., the Schmidt Car Frame Numberer illus-



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trated herewith is designed to serial number automobile and truck frames, producing clean, deep, and uniform numbering without accident hazards, it is claimed. The unit is arranged to mark in a smooth, positive, and quiet rolling operation using a barrel shaped numbering head of selective style.

In operation, the Schmidt Car Frame Numberer is swung into position with the frame between the anvil and number



Schmidt Car Frame Numberer

wheels. Pressure on the pistol grip switches provides for movement of the head across the frame from right to left or left to right, with the head marking as it moves. The current is automatically cut at the end of each stroke. Numbers can be changed by pressing a hand lever located at the right of the head. This lever provides for changing of any desired wheel as designated by a selector on a horizontal bar in front of the head. Each stroke of the lever advances the selected wheel to the next consecutive number.

The design of the Schmidt Car Frame Numberer allows for the marking of stock from 0.050 to 0.312 inch thick by using different anvils. An anvil is adjustable up to 0.110-inch variation by means of a small set screw. The machine is designed to mark frames varying plus or minus 0.020 inch at any anvil setting.

# SAVAGE

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#### NIBBLE YOUR COSTS

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Capacity 3/4" mild steel

FOR TUBE SLOTTING, TUBE SHAPING AND CUTTING FLAT SHEETS BY TEM-PLATE OR TO A SCRIBED LINE.

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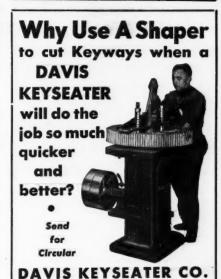
W. J. SAVAGE COMPANY

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Since 1885

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Pioneer Mnfrs. of Nibbling Machines



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ROCHESTER, N. Y.

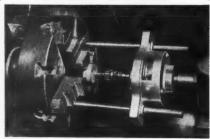
# R. D. Wood HydroLectric Open Gap Press

Furnished in various other sizes and capacities, the R. D. Wood HydroLectric Press shown in the accompanying illustration, product of the R. D. Wood Co., Public Ledger Bldg., Philadelphia 5, Pa., is a 250-ton open gap type, self-contained unit for use in performing flanging, bending, or straightening operations.

The sizes of the table and ram head are 30 x 30 inches and 8 x 6 inches respectively. Operating hydraulic pressure



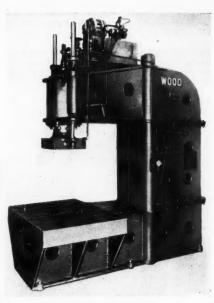
#### Here's How: TO TAP—and back out-WITHOUT STOPPING THE WORK OR REVERSING THE MACHINE



The Errington Auto-Reverse Turret Lathe Tapping Head is a new tool, practical, time-saving, money-soving. In a turret lathe setup, as illustrated, it allows you to tap the hole and back out the tap without stopping the work or reversing the machine. It's easy to operate: you simply feed the tap into, and out of, the drilled hole while the work is turning in the one direction. Can also be used on drill press work for production-tapping. Send for Complete Information

Established 1891

**ERRINGTON Mechanical Laboratory. Inc.** Main Office and Plant: Staten Island 4, N. Y.



R. D. Wood HydroLectric Open Gap Press

is supplied by a 2,000 p.s.i. two-stage rotary vane type pump displacing 17.7 g.p.m. The pump, with a directly connected 1,200 r.p.m. motor, is mounted on a fabricated oil reservoir on top of the press, which is furnished complete with protective devices, safety valves, pressure gage, and all necessary valves and control equipment and is simply controlled by means of a single four-way operating valve connected by linkage to twin control levers which are conveniently mounted on opposite sides of the machine.



#### Michigan Model 471-A Universal "Sine-Line" Gear Checking Fixture

Identified as the Michigan Model 471-A "Sine-Line," a universal checking fixture for checking gears, gear blanks, hobs, worms, worm blanks, milling cutters, and form tools up to 10-inch o.d. and 8-inch maximum face width has been introduced by the Michigan Tool Co., 7171 E. McNichols Rd., Detroit 12, Mich. With the various indicator assemblies available, the fixture can be used to accurately check tooth spacing, pitch radius, concentricity, and taper of spur

and helical gears, plus parallelism and crowning of spur gears. The fixture may also be used to check flute spacing, radial or off-center sharpening, depth of form, parallelism of straight flute, o. d. eccentricity, and the amount of form relief on form and milling cutters, as · well as lengthwise taper, concentricity of proof diameters, and multiple thread spacing or axial lead.

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With the two standard indicator assemblies furnished with the Model 471-A, tooth spacing, pitch radiconcentricity, and taper of spur and helical gears may be checked. The standard indicator assemblies can also be used to check the outside radius and concentricity of gear and worm blanks. An additional indicator assembly is designed for checking parallelism and curve - shave (crowning) contour of spur gears. Two special indicator assemblies are available to check thread spacing and pressure angle of worms.

The Model 471-A utilizes Carboloy cemented carbide tipped cones in a suitable range of sizes for the cone check of pitch

radius, concentricity, and taper of spur and helical gears. Indicators on the two standard and two special indicator assemblies have 0.0005-inch graduations, while the other special indicator assembly used in checking thread spacing of worms has an indicator with graduations in 0.0002 inch. Storage space for the indicator assemblies is provided on the dustproof shelves accessible through the door at the front of the unit. The headstock



does everything-in a bigger way! Now you can run nuts up to 5/8" bolt size, drill up to 3/8", tap up to 3/4", drive screws up to 5/8", drive and remove studs up to 5/8", etc....all without any kick or twist to you!

The amazing performance of the Ingersoll-Rand electric Impactool is hard to believe unless you see it in action—it saves up to 90% on nut running time-has full power in either direction-no motor burnouts, motor continues to run even if spindle is stalled-it is the greatest laboraiding, time-saving electric tool ever offered.

Start saving money now by calling your Ingersoll-Rand distributor for a demonstration of the electric tool everyone is talking about.

Both sizes are available for immediate delivery.

- Runs Nuts
- Reams
- Drills
- Runs Hole Saws
- Drives and Removes Studs
- Drills Masonry
- Extracts Broken Studs
- Drives and Removes Screws
- Runs Wire Brushes.
- Bores Wood



158 East Carson Street · Pittsburgh 19, Pa.



and tailstock ways are cast integrally with the base of the fixture and are scraped to surface plate precision. The longitudinal ways on the indicator base, in which ball bearings operate, have hardened steel inserts and are finished within 0.0002 inch on the parallel.

The lower sub-assembly of the indicator base travels lengthwise on its anti-friction bearings, with safety stops pro-



Michigan Model 471-A Universal "Sine-Line" Gear Checking Fixture Being Used for Checking Parallelism and Crowning of Spur Gear Teeth

vided to limit travel, ways for the upper sub-assembly cross slide are scraped, and the indicator is moved in or out by a rack and pinion. The headstock and tailstock may be clamped at any point on their scraped ways, and the tailstock center is retractable.

The Model 471-A occupies a floor space of 17½ x 33½ inches and is 43% inches high. The fixture may also be used for checking rake angle and parallelism of sharpened hobs, runout, depth of tooth of topping hobs, pressure angle of hob teeth, and lead and thread spacing of hobs, as well as to check milling cutters after sharpening.

# Roto-Finish Mechanical Separator

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The Sturgis Products Co., Sturgis, Mich., announces the addition to its Roto-Finish line of mechanical finishing equipment of a motor-driven separator for removing parts from chips or separating mixed chips into various sizes. The separator consists of a welded steel frame with an inclined surface on which is located a hoist pan serving as a hopper; and a waist-high separating table which supports a mechanized shaker screen assembly. The inclined surface for the hoist pan support is adjustable for correct gravity flow of parts and chips onto the screen.

The shaker screen assembly can be elevated from a horizontal to an inclined plane with a height of 4 inches on the end nearest the hoist pan. This height, together with the reciprocating motion provided by the motor drive, affords separation of parts from chips and automatic discharge of the former at the opposite end. The screen assembly is tapered at the discharge end and provided with a vertical lift gate so that parts do not leave the screen before the separation is complete.

The stroke of the screen assembly can be quickly changed by means of a variable adjustment on the motor drive to provide for varying amounts of agitation, depending upon the requirements of the



Roto-Finish Mechanical Separator

separation. The separator is equipped with a detachable tote pan shelf which is designed for easy mounting or removal. The unit can be driven by either a 110

# MULTIPLE DRILLING with a...



increases capacity 2 to 8 times!

FITS ANY DRILL PRESS

If your production requires drilling from 2 to 8 holes in a work piece, a MULTI-DRILL will cut costs and speed output up to 800%. The MULTI-DRILL is universally adjustable to any hole pattern—is compactly built to permit easy, unhampered operation with drill jigs or other special fixtures. Ruggedly built to take the wear and tear of high production work, the MULTI-DRILL will handle your long or short run multiple drilling jobs with ease and economy. MULTI-DRILLS are made in 6 and 8 spindle models and are furnished to fit any drill press.

There is a Commander MULTI-DRILL Distributor in your area. Write for his name, literature and complete details.

COMMANDER MFG. CO.

Product of Commander - Builder of the Commander Tapper



"Electralign" Sharpe Brown (Right) Being Used by Grinding Machine Operator in Adjusting Machine Swivel Table Accurately for Grinding a Taper

or 220-440-volt 3-phase 60-cycle gearedhead % h.p. electric motor with control

The Roto-Finish Mechanical Separator may be used with either a Roto-Finish CW-45 or CW-60 hoist pan. Screens 32x27 inches in size with varying meshes are available for all sizes of Roto-Finish chips. The separator measures 95 inches long x 70 inches high x 40 inches wide overall.

# Brown & Sharpe "Electralign"

To facilitate the setting of the swivel table of a grinding machine for grinding a straight shaft or an exact taper, the Brown & Sharpe Mfg. Co., Providence 1, R. I., has placed on the market the

A Real Spring Winder!

No. 1 Capacity 0 thru 3/32" wire \$1.50 No. 2 Capacity 0 thru 3/16" wire \$3.00 No. 3 Capacity 0 thru 5/16" wire \$5.00

Will earn its cost in one day. The Hjorth Perfection Spring Winder offers the ideal means of winding extension, compression, torsion, taper, double taper, or left hand springs. Try one in your shop. You'll like it and the price is reasonable.

HJORTH LATHE & TOOL CO. WOBURN, MASS. 10 BEACON STREET

"Electralign" shown in the accompanying illustration. With the instrument, true swivel movements are said to be indicated without relation to the condition of the table pivot, table wear which may occur with time, the weight of the workpiece, and the location of the headstock and footstock on the table.

The Electralign is arranged to locate a strain gage measuring head at each end of the sliding table and to measure the movements of the ends of the swivel table. By making measure-ments with strain gages, high sensitivity is said to be obtained and displacements of 0.0001

inch are claimed to be easily detected and amplified to well spaced graduations on an indicating scale. Since the amplifier has a scale which is set for the work length, deflections are read directly with

interpolation or transposition.

In using the Electralign, the operator makes a trial grind and measures the work to determine error in taper. He then sets the amplifier selector knob to the axial length over which he has just made his taper measurement and brings the measuring head spindles at each end of the table in pressure contact with the swivel table anvils. A knurled adjusting screw, located on the front of the righthand measuring head, is then turned to make the amplifier meter pointer read as many ten-thousandths off zero as the work was off taper. When the swivel



table is moved through its regular adjusting mechanism enough to make the meter pointer read zero, the error in tap-er has been corrected. This correction may be accomplished during grinding.

When it is desired to make external or internal measurements employing a comparator in conjunction with setting the table for alignment, the Electralign can be supplemented by an Electralign-Comparator Selector. Brown & Sharpe universal, plain and No. 13 universal and tool grinding machines are obtainable with the Electralign.

tration and correct breakdown of hardto-handle alloy rods. An additional feature of the welder is a high potential secondary circuit which is designed to assure ample dielectric strength. Efficiency of operation is provided for by a stepless full range output control which is said to afford the precise welding heat required. The high resistance windings of the machine are claimed to sustain proper open circuit voltage even at the lowest output settings.

The 4-coil transformer of the unit controls flux-diversion in such a way that

# "Sureweld" A.C. Welder

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An a.c. welder in models for both shop and industrial use is now being introduced under the trade name of "Sureweld" by the National Cylinder Gas Co., 840 N. Michigan Ave., Chicago 11, Ill. The welder is made in 12 models of which seven are for high speed heavy duty fabrication and five are for duty in garages, repair shops, machine shops, mills, welding shops, and wherever light production work is performed.

Outstanding features of the Sure-weld A.C. Welder include (1) a 4-coil transformer with movable magnetic shunt which is said to assure fine welding characteristics at every point within the output range, and (2) correct ratio of open circuit to are voltage, a provision that is claimed to assure fast burnoff, proper pene-



Safety Chuck Company

12 So. Clinton St.,

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Shop men all over the country have made it a habit to "SPECIFY PRO-CUNIER" when ordering tapping equipment. For over 30 years, Pro-cunier tapping heads and machines have given them better service . . faster tapping with less tap break-

THE FINEST IN

Experienced craftsmen will take nothing less than the sensitive Pro-cunier double-cone friction clutch; the heat treated Procunier gear mechanism which assures long, mechanism which assures long, trouble-free life; the easier to handle "Tru-Grip" tap holder.

When you "SPECIFY PROCUNIER" you get accuracy, dependability... and all-around top performance.

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Name

City..... Zone.... State.....

271

output current can be varied as required without altering secondary voltage, reactance, or other characteristics which produce a smooth stable arc. Output current is infinitely variable throughout the entire range, from the minimum practical welding amperage to the maximum capacity of the transformer.

Optional controls are available on the industrial models to meet special requirements. Where frequent power shutoffs are desirable, as when considerable jig or fixture time is required, an on-and-off power control consisting of a primary contactor and a choice of three switches



# TLANTIC For GEARS

Our service on small gears, due to new equipment recently installed, will interest you. Send samples or blueprints for quetation.

ATLANTIC GEAR WORKS, INC.

# GILMORE



Quality diamonds that render long service, and reduce truing costs. Send for illustrated Cat. No. 45.

F. F. GILMORE CO. 285 Columbus Ave., Boston 16, Mass.



"Sureweld" A.C. Welder

is recommended. For situations in which the welder can be stationed in an out-ofthe-way spot, an amperage remote control is available.

The shop models are easy to handle and move, large rubber-tired wheels and towing tongues providing for maximum portability.

# Simplex Special 4-Way Automatic Drilling Machine

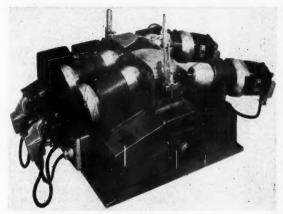
Product of the Simplex Tool Engineering Co., 2540 Park Ave., Detroit 1, Mich., the Simplex Special 4-Way Automatic Drilling Machine shown herewith is de-

# Accurate Hole Transfer Made Easy With NIELSEN TRANSFER SCREWS



Simply insert in holes, invert, strike sharply and you have centers and drill circles perfectly located. Reduce time and eliminate spoilage of other methods, 7 sizes U.S.S. Inexpensive — Last for years. Write for Circular.

NIELSEN TOOL &
DIE COMPANY
1960 W. Eleven Mile Rd.
Berkley, Mich.



signed for drilling four holes in a typewriter cover in one operation. The part is first clamped manually by quick-acting clamps, and the operator then pushes the start button located at the front of the machine, thereby causing the drilling units, which are provided with completely automatic forward and reverse movements, to drill the four holes required. Simplex Special 4-Way Automatic Drilling Machine

The drilling units can be mounted at any desired angle and may be used to drill any size hole from No. 50 to ¼ inch in diameter. Any desired number of units can be used for simultaneously drilling all of the required holes in a single piece in one operation.

#### Superior Automatic Counter and Stacker

For handling flat products that have to be stacked and counted, the Superior Punch

Press Co., 3610 Superior Ave., Cleveland, Ohio, has brought out the automatic counter and stacker shown in the accompanying illustration. According to the manufacturer, the machine is designed to count objects that come off the production line at a speed of up to 200 pieces per minute, stack them in piles, and then transfer them to the conveyor

# ANNOUNCING The NEW ERICKSON SPEED INDEXER Designed to Speed Up Milling, Drilling, Grinding and Similar Machining Operations

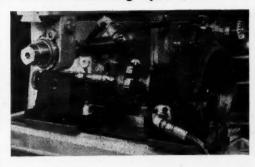
# BOOST PRODUCTION WITH THIS AUTOMATIC, POSITIVE-LOCKING ACCURATE INDEXER

Here, at last, is a sure-fire way to speed up those time-consuming indexing jobs, and bring production costs down another peg. The Erickson Speed Indexer is the answer! A recent development by Erickson Tool, it fills the long-standing need for an accurate, quick-acting, automatic, positive-locking mechanism with versatility that eliminates the need for many expensive work-holding devices.

The Speed Indexer may be mounted vertically or horizontally, may be operated by air or hydraulically, and may be made fully automatic by connection with table controls. Used for milling slots, keyways, flats, flutes, notches; for drilling, tapping—for practically any operation requiring regular spacing.

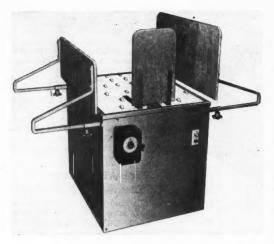
Ask for Catalog "A-1"

ERICKSON TOOLS DIVISION 2301-B Hamilton Ave., Cleveland 14, 0.



The Speed Indexer has already compiled an amazing record on many big production jobs—has reduced operation time as much as 50%. It is an accurate, precision-built fixture, designed to stand up on continuous production jobs. The Erickson Speed Indexer can mean increased production—decreased costs on your indexing jobs, too. Get full details now!

le id



Superior Automatic Counter and Stacker

can be readily operated by simply plugging into a suitable power line.

# Springfield "TR" Series Vertical Universal Grinder

The Springfield Machine Tool Co., Springfield, Ohio, announces the Springfield "TR" Series Universal Grinder, a hydraulically-operated unit which is offered in two sizes with swing capacities up to 32-inch diameter and nominal grinding capacities of 24-inch diameter. With this vertical design of grinder, work is laid on a solid

foundation where it is readily visible and conveniently accessible for setting-up purposes. In addition, the design is said to reduce vibration due to gravity to a minimum.

According to the manufacturer, the

system, each stack electrically counted and ready for the next operation.

Claimed to handle pieces from 9 to 82 inches wide and to transfer the counted stack in one-third of a second, the Superior Automatic Counter and Stacker



No waiting when you order Greaves Silent Bakelite Gears. • We have them in stock NOWI • Your order will go forward immediately. • You'll appreciate the silent operation and added smoothness provided by Greaves Silent Bakelite Gears. • You'll marvel at their great strength to carry big power loads . . . their remarkable ability to

successfully operate completely submerged in water.

• You'll welcome their low cost, • No metal reinforcements required. • Save Time... Money... Laborl

We also make si'ent gears of rawhide and Fabro.i.

Write for Circular.

Cincinnati, Ohio





DELIVERY ON

# KEYWAYS A Foot A Minute With A MASTER CONVERTER



3 Sizes—For any Lathe 9" to 72"
Capacity: 1 Cu. In. Metal Per Min. Per H.P.

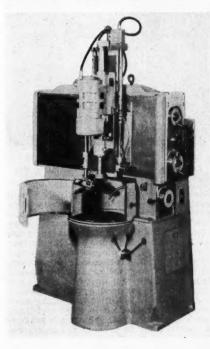
#### BASIC MILLER and 7 Interchangeable HEADS THE MASTER LATHE CONVERTER

The world's most versatile auxiliary machine tool. Result of 14 years of designing, engineering and building mult'-purpose milling and grinding attachments. Also does internal keyseating, drilling, reaming, boring, thread milling and hundreds of other metal working jobs. Maximum Performance, Minimum Cost. Write for Descriptive Literature.

MASTER MANUFACTURING CO.

is

Springfield TR Series Vertical Universal Grinder features unusual control facilities. A swiveling wheel head slide, solid adjustable stops, variable feed, tarry control, facing feeds, and other unique features are said to result in extreme precision control, particularly of related tolerances where several consecutive operations are completed in one setup of



Springfield "TR" Series Vertical Universal Grinder

the work involving combinations of internal, external, face, shoulder, and angular grinding.

#### DoAll Model DBW-5 Flash Welder

A production flash welder for joining band saw blades up to 2 inches in width is announced by The DoAll Co., 254 N. Laurel Ave., Des Plaines, Ill. Designated as the Model DBW-5, the unit can be equipped with special inserts for also joining wire, drill rod, bars, flat stock, and so on, up to figure in diameter,



thereby making the welder useful for salvaging broken tools, welding extensions on drills, reamers, taps, grinding wheels, and other products; joining coils or rings, and numerous other repair jobs and toolroom or production applications.

Designed to provide a complete welding service that includes not only welding but preparation of the material for welding, annealing, and cleaning up the weld, the DoAll Model DBW-5 Flash Welder features weld cycle which is motor controlled and fully automatic. Positive mechanical coordination of welding heat and pressure is said to assure the pro-

# CAMS

Our ROWBOTTOM cam cutting facilities are at your disposal for your cam requirements.

Let us have your inquiries. BLOOMFIELD TOOL CORP. BLOOMFIELD, N. I. 37 FARRAND ST.

STOP TOOL CHATTER

ELK TOOL HOLDERS, Precision Built, eliminate bit vibrations. Universal-Straight, Right or Left Hand Positions. ONE will replace TEN single purpose ·Tool Holders.

Write for Bulletin

ELK TOOLS, Inc.

71 W. Broadway

New York 7, N. Y.



DoAll Model DBW-5 Flash Welder in Use

duction of welds of uniform density and purity independent of the operator's experience. A positive stop on the movable jaw travel is claimed to prevent any possibility of the jaws making contact which would result in a burned-out transformer. Positioning or aligning controls are conveniently located for making adjustments to the welding jaws for keeping them in true alignment. All switches of the machine can be serviced by simply removing one panel. Selective annealing heats provide for variations in stock width and thickness. The welding jaws are made of a special alloy to prevent the accumulation of flash metal and are provided with replaceable wear strips.

The Model DBW-5 is equipped with a grinding unit for preparing material to be

# GEARS **GOOD GEARS ONLY** All Kinds—Any Quantity

AT THE RIGHT PRICE

THE CINCINNATI GEAR CO. Woester Pike

Cincinnati, Ohio

welded and for grinding off flash after welding. A saw thickness gage is included on the grinding unit for use in dressing the weld to the proper thickness. When an etching pencil is connected to a welding jaw, the machine can be used in performing etching operations for the permanent marking or numbering of tools, dies, parts, and so on.

For welding saw blades up to % inch in width, a lighter duty butt welder, designated as the Model DBW-1 is available, which can be either bench or pedestal mounted. The operating panel of this unit is illuminated, and the machine is supplied complete with annealing control,

saw weld selector, and built-in grinder with blade thickness check gage. worm shaft has a different diameter on both ends. To compensate for the different shaft diameters, one of the brackets is adjustable in height by a screw and handwheel (4). A hold-down device (5) is provided for each end of the shaft.

In cases where the mounting of the worm in bushings is desirable, the V-blocks may be replaced with a pair of cylindrical bushings or a pair of centers for holding the work between centers. One of the centers is adjustable to permit quick changing of the work. Both sets are furnished as standard equipment.

The worm carriage head is of the swiveling type and has graduations in

# YESTERDAY'S PIONEER . . . TODAY'S LEADER

# Recommended for use in Weldon bolders but may be readily used in collets.

• For cutting dovetails and similar work these angular cutters are indispensable. Set up time as compared with use of arbor type cutters is greatly reduced. They are truer running than the threaded hole type of cutters. Furnished in 60° angle and right hand cut. They are stock items.

Write for Circular ACH-1.

#### Parkson Post-War Model Gear Tester

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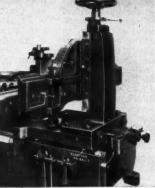
be

Designed to facilitate the accurate checking of spur gears and worm gears from 4 to 24 or 36-inch center distance, the Parkson Post-War Model Gear Tester shown herewith is announced by the George Scherr Co., 198-A Lafayette St., New York 12, N. Y. Many improvements are incorporated to save time in the setup without the need of making special fixtures or bushings in changing over from one job to another.

The accompanying illustration shows the Parkson Post-War Model Gear Tester in a typical worm gear setup. It will be noted that the worm integral with shaft rests in two V-brackets and the

THE WELDON TOOL CO. Cowland 4.





Parkson Post-War Model Gear Tester Set Up for Checking Worm Gear

degrees and a vernier (7) to provide readings in five minutes. The swivel feature is of particular importance when it is necessary to determine how many cross-bearings exist in the contact between worm and gear. A check for proper bearing must be made frequently since in resharpening the hob from time to time, the diameter of the hob changes; thus, also

the helix angle must be adjusted on the gear hobbing machine when cutting the gear.

A new feature

A new feature (8) for ease of setting of the swivel slide is provided, including two screws for adjusting and a nut for

locking. A handwheel and dial (9) graduated in one-thousandth of an inch for vertical adjustment of the slide are also

provided.

When the machine is required for checking spur, helical, or herringbone gears, the worm slide is removed, thereby freeing the taper bore in the floating slide for spur gear checking.

# MACHINE RACKS

The Standard Steel Specialty Company, a pioneer in the machine rack field, has brought an accuracy and finish to this product that cannot be matched by any other company.

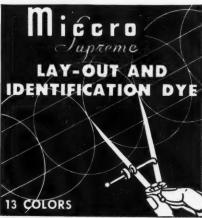
This rack is made from special machinery steel finished to our specification . . . cut by expert mechanics on machines designed especially for this work.

Send for our new catalog which gives information on Woodruff keys, taper pins, machine keys and features a chart for checking machine racks.

STANDARD STEEL SPECIALTY
COMPANY

BEAVER FALLS PENN

PENNSYLVANIA



For Tool, Die, Pattern or Template layout on metal . . . Quick identification of bar stock, sheet, strips or parts . . . Shows up in sharp relief—dries instantly . . . Write for trial sample and circular.

MICHIGAN CHROME & CHEMICAL COMPANY
6340 E. Jefferson Ave. • Detroit 7, Mich.

# Blum Model P-9 Single-End Punching Machine

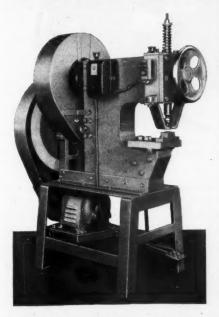
Specially designed for light fabricating of all types, particularly the punching of webs and flanges of small beams and channels such as used in railing, stair and fire escape work, a quick-acting single-end punching machine designated as the Model P-9 is announced by Julius Blum & Co., Inc., 552 W. 22nd St., New

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Blum Model P-9 Single-End Punching Machine

York 11, N. Y. The machine has a steel plate frame; the crankshaft is of chromenickel steel and the punch plunger is of forged steel. The punch can be lowered by hand so as to assure exact centering of the hole.

The clutch of the machine is a footoperated non-repeating type. If desired, the Model P-9 can be furnished with a triple punch attachment as optional equipment, the purpose of which is to enable the operator to instantly select any one of three punch sizes. Other special attachments can be furnished for cutting or notching angles for cutting flats, rounds and squares.

The Machine is supplied completely equipped with a motor and starter and



Many unique features make the ELLIS Dividing Head more than an ordinary indexing fixture. It is a precise, rugged unit with 6½" normal swing increased to 11" swing through the use of riser blocks. It TILTS more than 100 degrees in the vertical plane—SWIVELS 360 degrees in the horizontal plane—INDEXES by crank, or directly by hand. Work is held between centers, or in chucks or collets. The ELLIS Dividing Head is a universal work head that will increase the production versatility of your milling machines, grinders, drill presses and jig borers—write for complete details today.

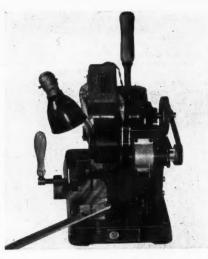


with gear and flywheel guards. The machine measures 45 x 27 x 60 inches high overall and has a net weight (without motor) of 1,280 lb. and approximate shipping weight of 1,400 pounds.

#### Attachments for Rouse Hand Miller

H. B. Rouse & Co., 2214 N. Wayne Ave., Chicago 14, Ill., announces the development of two new attachments for the Rouse Hand Miller, a high speed ball





Rouse Hand Miller Equipped with No. 7 Vise and No. 9 Cutter Guard

bearing motor-driven machine for taking light cuts in brass, aluminum, and similar materials. One of the attachments comprises a vise, designated as the No. 7, which is said to considerably increase the range and productive capacity of the miller. The vise is equipped with a specially slotted removable jaw which enables it to hold odd shaped pieces, and can also be converted into an economical jig for use on other equipment.

The other new attachment for the Rouse Hand Miller is a cast iron safety cutter guard, designated as the No. 9, which is designed to reduce operator injuries to a minimum. The guard can be readily located and adjusted left or right by the operator to meet the requirements

# For Your Convenience...

MINEOLA, N. Y.

the "Where to Get It" section of MODERN MACHINE SHOP, originated in February, 1940, provides a quick reference to machinery, tools and supplies advertised in the current issue. Use it consistently. You'll find it's very helpful. (See pages 352, 353 and 354.)

MODERN MACHINE SHOP

89 UNION ST.

"Red Ring" Gear Checking Heads in Use

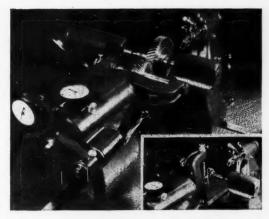
of his particular job. For further efficiency and convenience, the guard may be drilled for a coolant fitting which will convey the coolant directly to the cutting tool.

# "Red Ring" Gear Checking Head

Product of the National Broach & Machine Co., 5600 St. Jean Ave., Detroit 13, Mich., the "Red Ring" Gear Checking

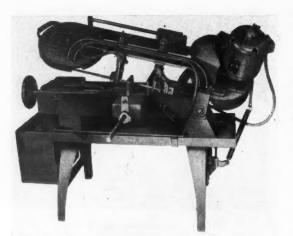
Head shown herewith is designed to determine the helix angle wobble of a gear, its size, eccentricity, and roughness of roll, simultaneously or separately by rolling the work gear with a master gear under predetermined pressure.

The spindle which carries the master gear holder is mounted in a yoke which may be rotated through 90 degrees. Thus,



either conventional or 90-degree drive gears may be checked with the same facility. The spindle is so mounted that when the two gears are under uniform spring loaded contact, it is very sensitive to both axial and radial displacement. Such displacements when the gears are rolled together are measured by precision dial indicators which are located on the





Wells No. 5 Utility Band Saw Equipped with Wet Cutting System

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the bed and legs. The complete system also includes a fluid tank with centrifugal type pump-motor unit and a screened intake, as well as tubing and a conveniently located flow control valve. All working parts are readily removable and easy to clean.

head behind the spindle yoke.

The checking head may be used on any of the standard Red Ring gear checkers. The head shown at the extreme right in the accompanying illustration is being used for checking index or tooth spacing.

#### "Carburit" Case-Hardening Paste

Paste which is claimed to provide an excellent casehardening job without spe-

cial equipment has been developed by Denfis Chemical Laboratories, Inc., 172 Pacific St., Brooklyn 2, N. Y. A major advantage claimed for the paste, which is known as "Carburit," is its ready use for selective hardening, the only operations required being that of covering the surface to be hardened with the paste and heating the work to a temperature of approximately 1,700 deg. F. A case 0.010-inch thick is said to form in 5 to 7 minutes, with only 25 to 30 minutes required for a 0.040-inch case.

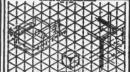
After heating with Carburit in place, the work is cooled and reheated to a temperature of 1,500 deg. F. The paste is then knocked off and the work genched. The paste can be readily applied to only part of the work or to the entire surface, as desired. When heated it dries out and becomes brittle so that it can be easily removed by striking the work before quenching. Any source of heat may be used with Carburit, it is claimed.

# Wet Cutting System for Wells No. 5 Utility Band Saw

The Wells Mfg. Corp., Three Rivers, Mich., announces that a self-contained wet cutting system is now available for the Wells No. 5 Utility Model Horizontal Metal Cutting Band Saw.

According to the manufacturer, the system permits safe use of higher f.p.m. cutting speeds than heretofore and increases blade efficiency. Portability of the machine is retained, inasmuch as the full area chip pan is firmly mounted between

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of guard. Stoppins permit rotation thru 180°
or 90° either direction.
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doutsproof.



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SOMERSET 320 Virginia St. TOOL CO.

282

# Pneumatic Friction Clutch and Brake for Bliss Presses

The E. W. Bliss Co., 450 Amsterdam Ave., Detroit 2, Mich., announces that its standrard flywheel type inclinable presses, as well as smaller geared sizes, are now available equipped with the pneumatic friction clutch and brake which were heretofore only provided on the company's large geared inclinable type presses.

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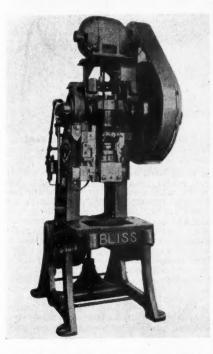
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With the clutch, maximum safety is

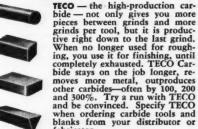


Bliss Inclinable Press with Pneumatic Friction Clutch and Releasing Brake Arrangement

said to be assured since the press can be stopped at any point in the stroke, thereby avoiding possible operator injury or damage to the dies. The friction clutch is also said to be ideal where an inching action is desirable to facilitate the setting up of certain types of dies. Moreover, the clutch permits the press to be reversed, thereby allowing the punch to be backed away from the die without completing the stroke, when necessary.







# TYPICAL PRODUCTION INCREASES

fabricator.

# Facing Cast Iron Housings (22" dla.)

# TUNGSTEN ELECTRIC CORP., UNION CITY, N. J.

Manufacturers of Tungsten Carbide—from ore to finished material—for over a quarter century,



#### Beckett Automatic Drill Press Feed

An automatic drill press feed featuring only two moving parts is now being manufactured under the trade name of Beckett by the Beckett-Harcum Co., 1140 Wayne Rd., Wilmington, Ohio. Of machine steel construction throughout, the feed is so designed that it does not extend beyond the face of the drill press when installed.

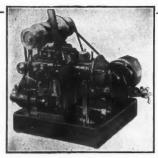
Controlled by a Beckett Hi-Cyclic air valve, the feed is available in two standard models; namely, a mechanical mod-

# "MULTI-PURPOSE" VISE "ADJUST-ANGLE" KNURL HOLDER SWIVEL-BASE VISE CENTERING VISE

Tools of Exceptional Usefulness REQUEST BULLETIN NO. 44 GRAHAM MFG. CO.

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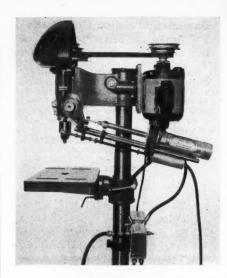
# **WALTHAM**

Pinion and Gear Cutting Machines

with revolving cutter will make 1, 2 or 3 successive cuts for watch pinions or may be used for fine pitch gears up to 1½" dia. Blanks are held and indexed by work spindle and usually supported by a tail center. Only straight teeth can be cut. Write for Bulletin No. 112.

WALTHAM MACHINE WORKS

Pinian and Gear Cutting Machine, Thread Milling Machine, Cylindrical Sub-Presses, Cutter Sharpening Machine, Small thread milling and gear cutters, Small special machinery.



Beckett Model 25E7 Automatic Feed Installed on a Drill Press

el designated as the 25M7 and an electrical model identified as the 25E7. The Model 25E7 is said to have all of the features of the Model 25M7 plus an arrangement for accurate automatic blind drilling and counterboring, and a splashproof electrical control operating a Beckett Hi-Cylic double solenoid valve which can be placed away from the moisture or dirt. The feed features a unique power transmission mechanism, involving a reel and flexible cable, that eliminates all slack and lost motion in providing thrust to the drill point which, with the precision control of the Beckett Hi-Cyclic valve, moves the drill rapidly and freely into drilling position without shock and with-

# ADVANCE CLAMPS Cut Set-Up Time 75%

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For use on all machines with T-slots.

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ADVANCE MACHINE WORKS

out employing any extra cushioning devices. The boring action of the drill starts immediately upon contact with the work, thus preventing dulling of the drill point, it is claimed. The correct thrust for any size drill may be provided so that the drill moves through the metal with maximum efficiency. At breakthrough, the thrust is instantly reversed, thereby eliminating all possibility of drill breakage, it is stated.

Designed to fit all drill presses having 1¼-inch pinion shafts, the Beckett Automatic Drill Press Feed is furnished complete with a Norgren filter regulator and lubricator, as well as flexible couplings. Larger models of the feed may be ob-

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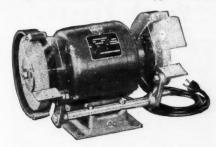
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#### "Grindmaster" Bench Type Grinder

Designed for grinding, buffing, tool sharpening, polishing, wire brushing, and light production and toolroom work, a bench type grinder known as the "Grindmaster" is announced by the Torq Electric Corp., 1033 Interstate St., Bedford, Ohio. The ½ h.p. grinder is furnished with two 6 x ½-inch wheels, one coarse

and one fine. Adjustable tool rests permit contact with the wheel at any desired angle. Wheel guards and transparent eye shields are said to provide ample protection for the operator.

The Grindmaster Bench Type Grinder



"Grindmaster" Bench Type Grinder

is supplied complete with a toggle type switch and 6-foot cord with plug. The motor is a standard Torg single-phase 110-volt 60-cycle unit, which is available at present in  $\frac{1}{4}$  and  $\frac{1}{3}$  h.p. types and soon in a  $\frac{1}{2}$  h.p. type. The motor, which has an operating speed of 3,450 r.p.m., is

# LEIMAN BROS. ROTARY VACUUM PUMPS

Ale from critical through by-pass in critical band onters.

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No control through the pass of the preventing loss of air pressure.

Air canning in at loiest at alled canner through this slot into critical band on the pass and there into the critical pass and the pass of the pass

AIR MOTORS • GAS BOOSTERS

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Machine Designers Secure Good Results When They Use the Standard Rotary Vacuum Pump of All Industry

Made in many sizes to tit any purpose or any dimensions—used in all industries tor picking up and carrying sheets of paper, cardboard, tin or other materials; handling liquids by vacuum or pressure as in bottle filling operations; also for agitating solutions; aerating water as in fish aquariums and elsewhere. They operate vacuum printing trames; vacuum canning

machines, cooling linutype machine molds, gas and oil burning appliances, furnaces, blowpipes, etc.. used in hospitals for etherizing, vacuum treatments, wound cleaning in operations; all sorts of operations in filling bags, cartons, collapsible tubes, and containers of all sorts; for creating instant and high heat in steam radiators; for vacuum holding chucks and for hundreds of other uses.

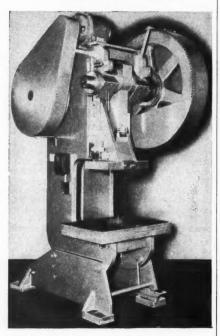
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# HEIDRICH

# Welded Steel Punch Presses



• 25 to 110 tons, straight side or inclinable.
• Extra flange on sides and enlarged bed makes clamping easier, gives more rigid support and longer life to dies. Shut heights from 11½" to 18" and throats from 10" to 14" depth provide extra room for bigger dies. Bed areas range from 18" x 30" to 24" x 36".
• Presses up to 80 ton have sliding square pin clutch . . . larger sizes have 3-point engagement sleeve clutch. Clutches have positive stops and non-repeat mechanism. Furnished complete with motor, switch box, and push-button control.

Write for complete details.

HEIDRICH ENGR. & MFG., INC.

equipped with a Torq Syncrosnap switch which is claimed to assure unusually smooth performance, eliminate burnouts of starting windings, and provide for long life of windings and contacts.

#### Electric-Arc Electro-Weld Spot Welder

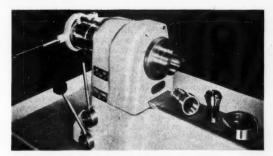
Electric-Arc, Inc., 152 Jelliff Ave., Newark 8, N. J., announces the availability of an electro-weld spot welder for



Electric-Arc Electro-Weld Spot Welder

fast, economical production. The model illustrated is a heavy-duty unit featuring 8-step current control, permitting 75 per cent secondary voltage adjustment.

The electrodes are standard size, water cooled, and can be easily and quickly renewed. The equipment features a spring-loaded foot switch, ample ventilation, and an arc welded steel casing with removable top and rear door for ease of inspection. The machine can be operated on 220 volts, 60-cycle single-phase a.c. If desired, the unit can be furnished with magnetic contactors and weld timers.



Hardinge Model VBS High Speed Precision Second Operation Machine

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e e Identified as the Model VBS, a high speed precision second operation machine with stationary style collet (No. 21 Brown & Sharpe) is announced by Hardinge Bros., Inc., Elmira, New York. Said to be particularly useful where close tolerances exist for length or shoulder specifications, the machine incorporates a preloaded ball bearing center-drive headstock spindle with a 1-inch round, %-inch hexagon, and %-inch square collet ca-

Hardinge Model VBS High Speed Precision Second Operation Machine

pacity. Eight spindle speeds are available in either forward or reverse direction from 230 to 3,500 r.p.m. Three other speed ranges are available for varied production requirements.

Additional features of the Hardinge Model VBS Second Operation Machine include pre-

cision hardened and ground dovetail bed ways, ball bearing lever-operated collet closer, constant full bearing double tool cross slide, automatic indexing sixposition pre-loaded ball bearing turret, self-draining oil pan with integral sump, and welded steel pedestal base.

### L&N Steam Homo Tempering Furnace

Scale-free tempering and strain relief of metal parts are said to be effected by the L&N Steam Homo Tempering Fur-

### WHITNEY- JENSEN PRODUCTS

### No. 52 BENDER

CAPACITY, MILD STEEL

'4" ROUND SOLID BAR

'4" x 2" FLAT BARS

'4" x 2" NOTCHED ANGLE IRON



Bender is easy to operate and ruggedly built.

Patented adjustment automatically compensates for the thickness of metal.

### No. 50 ANGLE IRON MITRE NOTCHER

CAPACITY—ALL SIZES OF ANGLE IRON THRU 2" x 2" x 1/4" WEIGHT—62 LBS.





nace illustrated herewith, product of the Leeds & Northrup Co., 4934 Stenton Ave., Philadelphia 44, Pa. High speed steel



L&N Steam Homo Tempering Furnace in Use

tools, cast iron, sintered powdered iron compacts, and non-ferrous alloys can be treated at temperatures up to 1,150 de-

grees Fahrenheit with the aid of the furnace.

The furnace utilizes a protective steam atmosphere in conjunction with forced convection heating, and is equipped with a Micromax temperature control. Steel parts tempered in the furnace are said to be provided with a uniform blue oxide finish and to be free from scale. Moreover, parts so treated are claimed to feature improved machinability and unusual resistance to corrosion and wear, and can be easily cleaned for subsequent plating. Steam from a process line or a small boiler is fed into the work chamber through an inlet in the bottom of the furnace which, although especially designed for steam tempering, can also be operated with a natural air atmosphere.

### Automatic Filter Cleaner Unit for "Dustkop" Model 1150 Dust Collector

Designed to maintain initial suction, reduce filter replacement, and eliminate manual filter shakedown, an entirely self-contained automatic filter cleaner unit for use in connection with its standard "Dustkop" Model 1150 Dust Collec-





#### **Blind Hole Bottoming**

Many enthusiastic users report that the Behr Boring Bar actually pays for itself in the first four weeks of operation. Just ask the man who uses one.

This new patented bar is chatter proof, extremely accurate and ultra efficient. Has interchangeable blades and accessories. It is unequalled for versatility and effi-

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CENTER SCOPE PRODUCTS

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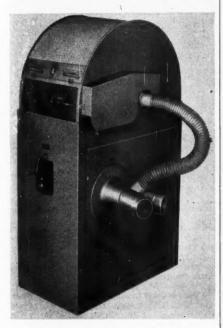
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The principle on which the automatic self-cleaner operates is as follows: On certain heavy duty buffing operations some of the extremely finely divided lint fails to separate out in the cyclone. When it strikes the filter, however, the individual fibers tend to adhere to one another. Two or more of such fibers are said to



"Dustkop" Model 1150 Dust Collector with Automatic Filter Cleaner Unit

always separate out in the cyclone. Thus, the automatic self-cleaner removes this lint, by suction, from the inner surface of the filter and sends it through the cyclone where, as described above, the lint fibers are taken out of the air stream.

The automatic self-cleaning mechanism consists of a semi-circular filter of non-inflammable spun glass and a motor driven nozzle which is enclosed within the assembly to reciprocate continuously over the inner surface of the filter. The nozzle is connected by means of a flexible fabric hose to the inlet of the Dustkop, providing the suction for the nozzle and, at the same time, establishing a re-entry



The RPM's stay up while grinding... not only when the grinder runs idle.

It is an established fact that surface speeds must stay up to approximately a mile a minute if you want to grind — not just rub. The speed of Kipp air grinders drops but slightly when put to work. That means better work—longer wheel life.

Buy Kipp air tools for best results, lower prices.



to the cyclone for the lint. A fractional horsepower motor with reduction drive is connected with a crank arm and the latter to the piping, which terminates in the nozzle.

### Sheffield Automatic Piston Pin Checking and Segregating Machine

Piston pins are checked for average diameter and automatically segregated into six classifications by a highly efficient



# FORD ROTARY FILES The Right file for the Right Job Three Distinct Types 1. Hand Cut Files 2. Ground Burs 3. Carbide Cutters Rotary Files Exclusively for over 25 Years. Available from your Mill Supply House.

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Short stubby jaws allow the Atlas to be used in applications where space is limited or where light weight is essential. Bearing loads held to absolute minimum by large bearings OF EQUAL SIZE located at maximum distance from center of joint. For full details write Dept. B.



Makers of Atlas and Vulcan Universal Joints

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In the West Link Belt Co., Los Angeles, Son Francisco, Portland.

Spottle, Oakland, Sockage.



Sheffield Automatic Piston Pin Checking and Segregating Machine

machine developed by The Sheffield Corp., Dayton 1, Ohio.

Pins are normally loaded into a chute which has a "no-go" gaging fixture to prevent oversize parts from being accepted. The remaining parts are gravity fed into a locating vee where a motor driven arm progresses a part into an air ring. After it comes to rest, the part is checked by jets mounted in the ring which operate Sheffield "Airlectric" heads. These, in turn, actuate solenoids which open and close trap doors to the segregating chutes. The pin is then pushed through the air ring by the next piston pin to be checked, and is carried along by the

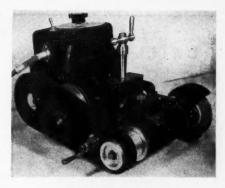


traveling mechanism until it reaches its proper trap. The production segregating rate of the machine is approximately 2,400 pins per hour.

#### Koett Universal Attachment

A universal attachment which may be mounted on a lathe, milling machine, planer, shaper, and so on, or used as a machine in itself to perform internal grinding, external grinding, milling, boring, and drilling operations has been placed on the market by Koett Universal, Inc., Oneonta, N. Y. The attachment is powered by a % h.p. universal a.c. and d.c. motor with rheostat control. Changeable spindle and motor pulleys, together with the rheostat control, make possible speed changes of from 500 to 31,000 revolutions per minute.

The Koett Universal Attachment has a horizontal travel of approximately 2 inches by thousandths of an inch and a vertical travel of approximately 5 inches by thousandths. In addition, the attachment can be tilted 30 degrees right or left so that compound angles can be obtained when the unit is mounted on a machine tool. The high speeds provided by the attachment are said to be of particular ad-



Koett Universal Attachment

vantage where carbide end mills or carbide burs are used.

The spindle of the Koett Universal Attachment is rigidly built for strenuous work up to the limit of its horsepower capacity. The spindle is 1 inch in diameter and has a 2-inch diameter ball bearing, the assembly being dynamically balanced to provide for fine finishes. The spindle is also sealed at the factory so



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## TOOL ADJUSTMENT TIME

### WITH SPECIAL ERICKSON - STATE BORING BAR

Leading automobile manufacturer has eliminated need for costly tool adjustment at machine on connecting rod boring job, thanks to a specially designed Erickson—State 4 cutter boring bar. Special boring bar is designed with readily detachable 4 cutter boring head. Perfect tool alignment never disturbed, because only the head is removed when tool change is required. Operator simply removes dull head, replaces it with a sharpened one, and sends dull head to the tool room. New tool is in perfect alignment —only the head has been changed. Result: adjustment time eliminated—production increased—tool cost reduced.

### Let Us Help You Solve YOUR Boring Bar Problem!

Put Erickson—State's famous 4 cutter principle to work on your tough boring bar job. Get these big advantages: faster feeds and speeds; more regrinds; bit rigidity and less adjusting time with exclusive locking feature; "ye" to 51/2" range; bits replaced easily and inexpensively.

The Erickson—State Boring Bar can lick your problem too. Get full details now.



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Maximum Gripping Power with Extreme Accuracy and Long Life. Write for Catalog.

T. R. Almond Mfg. Co. Ashburnham, Mass. U. S. A.

### "SKELTON" TAPER REAMERS



The Roughing Reamer with two cutting edges ground radial on a taper to correspond with hole to be reamed. Two opposite edges are "backed off" to govern chip thickness. This "safety edge" prevents "hogging in" or "chattering." A special feature permits straight, centralized holes, even though turret is out of line with spindle. Write for Folder "S" describing Taper Reamers and Boring Bars.



**Finisher** 

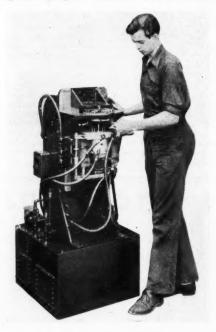
Morse, B & S and SAE Tapers in stock. Specials to order.

**Dealer Territories Available** 

that further oiling or greasing is not necessary. A speed reducing unit provided as standard equipment enables a 2 to 3 h.p. torque to be developed on the spindle when operated at low speeds.

### Zagar Special Purpose Drilling Machine

Product of Zagar Tool, Inc., 23880 Lakeland Blvd., Cleveland 23, Ohio, the special purpose machine shown here-



Zagar Special Purpose Drilling Machine

with is designed for drilling holes from underneath for the purpose of clearing out chips and increasing general overall production. The machine is composed of a standard Zagar gearless drill head on each side of which are located two hydraulic cylinders that act as the feed mechanism for the head. This mechanism provides for a fast approach of the head to the drilling position, and feed rate during drilling, and a fast return to the original position. The drills receive their rotation direct from a direct drive electric motor.

The work-holding fixture consists of an indexing mechanism, wherein the parts are loaded on the top and indexed under a hard steel plate. Parts are loaded while the drilling operation is taking place. The machine is entirely self-contained and requires no outside connections with the exception of the electric power. It has a built-in lubricating system whereby the oil is exhausted from a hydraulic pump into the top of the drill head and drained out at the bottom of the drill head. With the system, the drilling head is kept both cool and well lubricated. Cycling is controlled by electrical limit switches and solenoid-operated hydraulic valves.

Standardized and applicable to a variety of small part drilling operations, the machine has a welded steel base wherein is contained a hydraulic pump for the hydraulic circuit and an electric motor for driving the hydraulic pump.



Illustration Showing Olson Two-Speed Gear Head May Be Attached to Portable Milling Head Using Present Motor and Drive Pulley

### Olson Two-Speed Gear Head

Designed to withstand the severest strains, a two-speed gear head for all types of portable vertical milling ma-

chine heads is announced by Olson Industrial Products, Inc., 40 W. Water St., Wakefield 59, Mass. Said to allow for the



doubling of the number of speeds of portable milling heads and thereby increasing the number of uses of the machines in which these heads are adaptable, the unit provides ratios of 1 to 1 and 6 to 1 and comprises a housing of heavy aluminum with ball bearings and hardened steel gears.

According to the manufacturer, the Olson Two-Speed Gear Head provides for long tool life due to the use of proper speeds; allows for the production of unusually smooth finishes; and permits the use of large type cutters, as well as the controlled boring of large holes. A flexible connection between the motor and gear head allows for easy mounting and eliminates cramping of the motor shaft, it is claimed.

## "Hisey" Redesigned 1 and 2 H.P. Precision Internal and External Grinders

With a view to making the same changes in its entire line of precision internal and external grinders from ¼ to 10 h.p., The Hisey-Wolf Machine Co., Cincinnati 25, Ohio, announces that the 1 and 2 h.p. sizes have already been rede-



"Hisey" Redesigned Precision Internal and External Grinder

signed. The principal change is in the motor mounting. An adapter base for the motor is now supplied with a flat key and keyway between the adapter and main frame casting. The motor is mounted on the adapter with the usual four screws, while only two screws are used to clamp the adapter to the main frame, thus permitting quick adjustment of the V-belts when changing from an external to an internal spindle head or vice versa. The keyway is said to assure accurate belt alignment at all times.

According to the manufacturer, other





... because they're made of a special, correctly - beated alloy steel. Central striking point assures uniform marking. Thumb side marking assures easy use.

You get more mark per dollar with THOR STAMPS. Write for catalog and prices.

The Pittsburgh Stamp Co., Inc.

## SEIBERT IMPROVED MULTIPLE SPINDLE DRILLING EQUIPMENT

Standard slip and bracket type spin-dles are stocked for immediate delivery. Made of alloy steel, heat treated and precision ground to an Brackets excellent finish. Adapters Lower Drives Write • Pinion Drive for catalog. Shafts SPECIAL SPINDLES Consult SEIBERT engineers before retooling or replacement. Quality Delivery Manufactured by

Seibert & Sons, Inc. East Peoria 8, III. improvements have been made throughout so that cylindrical, internal, and surface grinding operations can be performed when the 1 and 2 h.p. grinders are mounted on lathes, boring mills, planers, milling machines, and so on.

### Lindberg Continuous Flow Vibrating Hearth Furnace

The Lindberg Continuous Flow Vibrating Hearth Furnace, a controlled atmosphere unit specially designed for hard-

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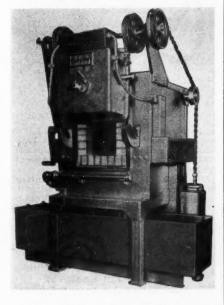
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Lindberg Continuous Flow Vibrating Hearth Furnace

ening small parts, is announced by the Lindberg Engineering Co., 2444 W. Hubbard St., Chicago 12, Ill. The vibrating action of the hearth provides for movement of the work through the work chamber to a chute through which the parts fall into the quench. With the vibrating hearth, parts are said to flow by high frequency vibration instead of hopping as the result of intermittent abrupt impulses. Movement of the hearth is not perceptible to the eye, and there is no jarring of the furnace equipment, it is claimed.



### Tool-flex NEOPRENE MOUNTED

#### RELEASING TAP HOLDERS

Simplifies topping on turret lathes, drill presses, screw machines and engine lathes. All moving parts of holder are made of high grade tool steel, heat-treated and ground to close tolerances.





Tap breakage is held to minimum due to its Neoprane Mounting which absorbs shock, keeps taps contered and permits them to follow the criginal hole. The simple construction of Tool-flex assures long life under high speed operation.

Made with either taper as shown above or straight shank as shown at left. Made for right or left hand tapping.

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BURG TOOL MANUFACTURING CO.

Provided with the furnace is an oil quench tank, as shown, or a salt quench tank for martempering or austempering operations. The furnace is built for temperatures up to 1,800 deg. F. and is electrically heated by heavy nickel-chrome elements.

### Palmer-Shile Wire Rope Sling

A wire rope sling of improved plowsteel is announced by the Palmer-Shile Co., 16022 Fullerton Ave., Detroit 27, Mich. Materials handling with the sling

Imported—SWISS
Collets and Carbide Bushings

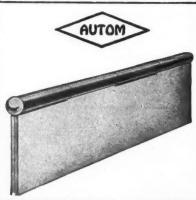
FOR SWISS TYPE SCREW MACHINES

Most fractional sizes shipped from stock.

G and D Sales Co.

111 Dillerville Road

Lancaster, Pa.



### **CONTINUOUS HINGES**

Manufactured by

AUTO MOULDING & MFG. CO.

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CHICAGO 19



Palmer-Shile Wire Rope Sling

is said to be simplified by two 6-inch loops spliced in and sewed with tape. Maximum safety in ordinary and specialized lifting operations is claimed to be afforded by these loops.

The wires used in the construction of the sling are of six strands, 37 wires to the strand. The sling is manufactured in four 1/4-inch rope diameters of 3/6 to 3/6 inch in standard 6-foot lengths, with extra lengths available to specifications.

### Elox Model "X" Broken Tool, Stud and Pin Remover

To meet the demand for a lightweight portable disintegrator which can be conveniently carried to the job and set up



### DRILL THESE HOLES

BY A QUICK, EASY, INEXPENSIVE METHOD Your business letterhead will bring literature. WATIS BROS. TOOL WORKS Wilmerding, Pa.



Elex Model "X" Broken Tool, Stud and Pin Remover

in the chuck of a drill press, the Elox Corp., Clawson, Mich., has placed on the market the Elox Model "X" Broken Tool, Stud and Pin Remover illustrated herewith. The unit is designed to fulfill the needs of shops where broken taps, drills, removers, studs, and pins in sizes from 0.085 inch upward occasionally require removing.

To use, the Model X is said to require only a source of city water and electricity at lighting voltage. According to the manufacturer, use of the disintegrator involves no danger since the working voltage at the point of contact on the broken tool is extremely low (about the same as a flashlight). The time required to remove a broken tool depends upon many variables; however, the self-feeding feature built into the Model X is said to provide for a fast, clean cut regardless of the nature of the job. The unit, it is claimed, does not anneal the work, and there is no distortion, electrolysis, or mutilation of any kind. In addition, the hole wall or thread is not touched or damaged in any way, it is stated.

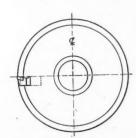
### Phillips Tumbling "Rotomatic" Vapor Degreaser

Efficiency and economy in vapor degreasing is said to be provided with the Phillips Tumbling "Rotomatic" Vapor

### "FLEXIBILITY" in Carbide Milling

A good mechanic knows that a prime requisite for any carbide cutter is that it can be changed speedily and economically to meet his specific requirements.

Howald Cutters are designed so that any cutting angles or rakes can be applied easily. The



blade slots of the shell and face mills are broached in a position that places the entire top of the blade in the plane of the center line (see line drawing). The blades can be made up as easily as a lathe tool bit prior to insertion into the cutter head.

These truly universal Carbide End, Shell and Face Mills are described in Bulletin No. 23. Send for your copy.



W. T. HOWALD MACHINE WORKS
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A PORTABLE ELECTRIC CHISEL MORTISER!



This fine English tool now available for the first time, is adaptable to a wide range of uses and accessories in both factory and field. It is quickly adjustable to various sizes of mortise. It serves as both a bench drill and your hand drill. With auxiliary handle and 8 inch buffing head, it is an efficient polishing tool. Steel drilling capacity &" diam. Speed on full load 450 r.p.m.,

110-120 volts universal A.C D.C. Save costs! Get this long needed tool today !

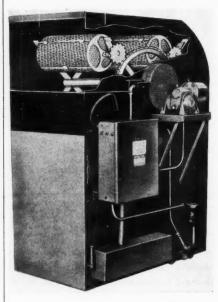
Lower your Production Costs with these Fine English Tools. Proved for Half a Century in 50 World Markets. Now available for the first time in the United States.



S. WOLF & CO. LTD. LONDON

d Distributor Philipaltis on request. Wareh U.S. Factory Representative, Fred L. Stuart Street, New York 18, N.Y. LA 4 2255 Degreaser shown herewith, product of the Phillips Manufacturing Co., 3455 W. Touhy Ave., Chicago 45, Ill. The necessary cleaning of innumerable small parts from an automatic screw machine, odd shaped bolts, couplings, small intricately shaped castings, hollow dowel pins, and numerous other parts is claimed to be easily and economically accomplished with the machine.

The parts to be degreased are placed



Phillips Tumbling "Rotomatic" Vapor Degregser

in baskets which are tumbled to eliminate cupping of the solvent in crevices and hollows. Each tumbling basket is rotated by a small spur gear which, in turn, rotates on a large ring gear. As the reel rotates, the tumbling baskets are, in turn, rotated around this ring gear as it goes down into the vapor, and, still tumbling, the baskets come up on the other side. The tumbling baskets make approximately nine complete revolutions to each complete revolution of the reel. Each tumbling basket is fitted with a tubular shaft having a spring stub-shaft on one end which enables the tumbler to be quickly and easily removed by merely compressing the spring.

### Lehigh-Marton Model 3MA13 4-Way Cabinet Valve

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Described as particularly suitable for use on standard machine tools where the machine tool bed is not provided with a cavity for the instrument insertion, the Lehigh--Marton Model 3MA13 4-Way Cabinet Valve illustrated has been placed on the market by Lehigh Foundries, Inc., Easton, Pa. The unit includes a rear connection for air intake and two outlet connections for operating equipment such as a double-acting cylinder, and so on.

The panel face has a removable plug self-contained with an air strainer which can be easily removed for cleaning. A sight oil gage at the right is provided with the option of either an oil fitting for use with a pressure oil gun, which allows the lubricator in the inside of the cabinet to be refilled with an auxiliary line shutoff valve, or an oil fitting with a ½-inch socket pipe plug. The sight oil gage is provided with Plexiglas and a red line to indicate oil level.

The 200 p.s.i. air pressure gage supplied with the Lehigh-Marton Valve is graduated in 5-lb. increments. An adjusting



Lehigh-Marton Model 3MA13 4-Way Cabinet Valve

knob is provided for increasing, decreasing, and setting the air pressure desired for the functioning of shop apparatus. For fast operation, the valve is provided



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2060 READING ROAD

CINCINNATI 2, OHIO, U. S. A.

with an operating control lever having three positions, one each to the extreme right or left for delivering air to the top and bottom of a double-acting cylinder or equal and a center position for neutral. The exterior surfaces of the panel and cabinet are finished in prime paint.

### Martin Adjustable Die Enclosure Guard

A universally adjustable die enclosure guard for the protection of operators in performing blanking, punching, strip-

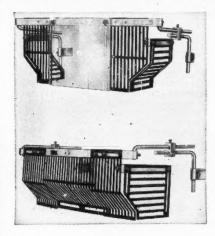
### **60 YEARS MANUFACTURING**

Multiple Spindle Drilling and Tapping Machines • Automatic Drilling and Tapping Units • Multiple Spindle Attachable Drill Heads • Hot and Cold Swaging Machines • Hammering Machines • Tools, Jigs and Fixtures • Contract Work • Special Machinery.

LANGELIER MANUFACTURING CO.

Providence 7, Rhode Island

feeding, and similar types of first-operation work on punch presses is now being offered by W. I. Martin and Co., 711 S.



(Above) Martin Type L Adjustable Die Enclosure Guard. (Below) Martin Type K Adjustable Die Enclosure Guard

Dearborn St., Chicago 5, Ill. According to

the manufacturer, the design of the guard makes it adaptable for difficult operations where work must be held very close to the dies.

The Martin Adjustable Die Enclosure Guard features an inwardly curving panel construction which extends under the construction which ex

The Martin Adjustable Die Enclosure Guard features an inwardly curving panel construction which extends under the ram close to the edge of the die, thus permitting work to be held as close to the die as would be possible without a guard yet with complete safety for the operator, it is claimed. The guard is available in two types. The Type L includes offset side gates for side-feeding



Production-improving features of this unusual machine—ham mer piston rotated by adjustable speed air motor...rugged construction to maintain alignment of hammer and anvil post ... automatically-timed adjustable length of hammering cycle to prevent under-riveting... aspirating type continuous piston lubricator... elevating anvil with accurate adjustment... optional manual controls... suitable work tables... all essential accessories... wide range of work... practical design based on years of producing experience.

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### GRAY TURRET HEAD METAL CUTTER OR NIBBLER

N.A.M. Pioneer Award

Most modern Nibbler for Template Cutting, Tool Rooms, Shipbuilding, Aircraft Parts, Aircraft Tubing, Sheet & Plate Shops.

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operations, while the Type K has offset front gates for front-feeding operations. The center gate of the guard may be raised to permit feeding or holding work from the front as with slide or short feeds; the side gates may be raised or tilted to clear obstructions; the end front gates may be adjusted inward to vary the overall width of the guard to fit each die; and the entire guard may be raised or lowered by means of adjustments provided in the mounting brackets. The individual gates are made of heavy gauge steel perforated with vertical slots in front for easy visibility and with horizontal slots in the side gates to permit work to be fed through the gates if desired. Transparent plastic center gates are available for operations where extra clear visibility of the work is required.

The Martin Adjustable Die Enclosure Guard is available in a complete range of standard sizes to fit practically any press from the smallest bench model to the largest open back inclinable or straight-sided press. Special sizes to meet unusual conditions are available to order.

### "EutecRod" 1700 High Silver Alloy

The Eutectic Welding Alloys Corp., 40 Worth St., New York 13, N. Y., announces the availability of "EutecRod" 1700, a high silver alloy for stainless steel, copper, brass, bronze, tungsten carbide, and steel.

Described as an unusually "thin-flowing" alloy, EutecRod 1700 is claimed to provide a good color match to stainless steel and is particularly recommended for making lap, square, butt, and T-joints and for sealing and filling small cracks and defects. In addition, the alloy is said to provide excellent results in joining tungsten carbide to steel shanks and in welding light gauge metal, as well as in the joining of stainless steel and in the welding of steel to steel or to other metals.

According to the manufacturer, Eutec-Rod 1700 bonds at a temperature of from 1,020 to 1,250 deg. F. and has a tensile strength of 64,000 to 68,000 p.s.i. It is available in  $\frac{3}{33}$ ,  $\frac{1}{16}$ ,  $\frac{3}{64}$ ,  $\frac{1}{32}$ ,  $\frac{1}{64}$ -inch diameters.

### **Erwood Rotary Layout Table**

Developed to facilitate accurate layout work in toolrooms, model shops, and so on, the rotary layout table shown herewith, product of The Erwood Co., 214 Woodstock St., Crystal Lake, Ill., is cal-



Early in 1928 we installed a Grant 5%" Model B Worm Gear Reduction Unit as the driving medium on a horizontal conveyor. This Unit gave a reduction in speed of 33 - 1, power being supplied by a 2 H.P., 1200 R.P.M. Motor directly connected to the reduction unit by a flexible coupling. This Unit has operated approximately thirty hours per week since installation, without attention or repair except for regular cleaning and lubrication. A good record for a good unit.



Performance stories like the one above don't "just happen". Grant Reducers perform years longer without maintenance because they are designed and built from the finest materials with utmost precision. All Grant Reducers are equipped with radial thrust ball bearings, oil seals, gears of high test bronze, worms of chrome vanadium steel and many others.

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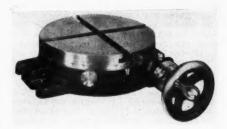
SPEEDMILLER Sr.

for Overarms 31/4" to 5". No. 3 Morse Spindle. Collet Capacity 3/4".

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Manufacturing Co. EAST DETROIT MICHIGAN



**Erwood Rotary Layout Table** 

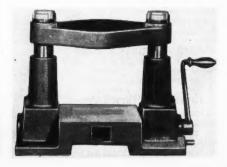
ibrated for a full 360 degrees of rotation and includes an index on the adjusting spindle which permits settings to within six minutes.

The precision worm and gear of the table have provision for adjustment to compensate for wear or backlash. The table base, with four mounting slots, is cast nickel alloy iron and ground on both sides for parallelism. Two machined right-angle T-slots are provided in the table for fastening work.

### Siewek Type C Midget Spring Jig

Claimed to be especially adaptable for odd shaped work in which holes must be drilled, reamed, tapped, or spot-faced, a midget size spring jig designated as the Type C has been added to the line of drill jigs manufactured by the Siewek Tool Co., 2862 E. Grand Blvd., Detroit 2, Mich. Open on both sides with the posts centrally located to further aid in holding all pieces rigidly when performing multiple drilling operations, the jig utilizes a spring lock which is said to assure a constant downward pressure that provides

Siewek Type C Midget Spring Jig



for efficient precision drilling on rough castings since the downward pressure is claimed to hold the pieces firmly as rough spots are worn off by the machine vibration.

The Siewek Type C Midget Spring Jig is available in two models designated as the 1600 and 1700. The Model 1600 has a working area of 3 x  $3\frac{1}{2}$  inches with a closed opening of  $2\frac{1}{6}$  inches and a lift of  $\frac{3}{4}$  inch. The Model 1700 has a working area of  $4\frac{1}{2}$  x  $4\frac{1}{2}$  inches with a closed opening of 3 inches and a lift of 1 inch.

### Black & Decker 3/8-Inch Impact Wrench

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A portable electric impact wrench which is designed to quickly tighten or remove either left or right-hand nuts, bolts, and cap screws with up to %-inch thread diameters has been announced by The Black & Decker Mfg., Towson 4, Md. The tool is arranged to rapidly spin a free-running nut or bolt to a seating position with a high speed, direct-drive action, after which, within a matter of seconds, a rapid rotary hammering action provides for driving of the nut or bolt to maximum tightness. In removing a fas-



Black & Decker %-Inch Impact Wrench

tener, the hammering action loosens the nut or bolt and the direct-drive rapidly spins it free.

Light in weight and with minimum torque reaction so that operator fatigue is reduced to a minimum, the Black & Decker %-Inch Impact Wrench includes a reversing switch which allows the tool to be used for either driving or removing fasteners, the efficiency of the unit being



## Viking

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Carbide Tools
with Mechanical Lock

Get The Full Measure Of Performance Out Of Carbide With The Viking Mechanical Lock Carbide Tool Holders.

Users report up to three times the number of pieces per grind with Viking Tools over identical grades of Carbides on Brazed Shanks. Shorter Tool Reconditioning Time Further Decreases Tool Costs. • Available with either "Built-In" or Replaceable Mechanical Chip Breakers, providing additional savings by the elimination of costly ground in chip breakers for steel cutting operations. • No objectionable projections on Holders. Fits standard tool posts and blocks. • Delivery from stock on all Standard Turning and Facing Tools from 3/4" to 2" Tool Heights.

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Viking TOOL COMPANY

SHELTON

the same in either direction, it is claimed. The switch is mounted on the lower side of the housing where it is protected from sectional contact. The wrench is made of sturdy aluminum castings and has a powerful universal motor. In addition to a side handle with automatic-release swtich, a reversing switch, and a three-conductor cable with plug, the wrench may be obtained with six hexagon sockets ranging from % to 18 inch.

### Dremel "Moto-Sander"

The Dremel Mfg. Co., Racine, Wis., has announced the development of a combination electric sander and polisher to be known as the "Moto-Sander." Compactly made, thus enabling it to be used in close quarters and other hard-to-get-at places, the tool weighs 21/2 lb. and is equipped with a rubber cushioned sanding pad which measures 21/4 x 51/2 inches.

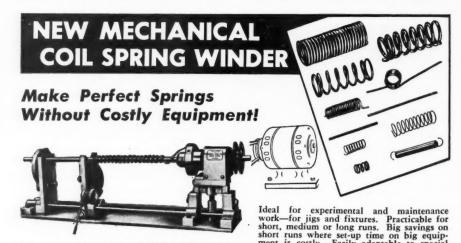
According to the manufacturer, the Moto-Sander has only two moving parts and never requires oiling or adjustment. Designed to operate quietly on 110-220 volts, 60-cycle a.c., the unit is constructed to deliver approximately 7,200 strokes per



Dremel "Moto-Sander"

minute, the short rapid strokes readily freeing the sandpaper of excessive dust and particles, it is claimed. A cam-type clamp holder permits ready changing of sandpaper.

Said to be ideal for finishing all types of surfaces, the Moto-Sander is supplied



jobs.

It's easy — girl operators quickly attain maximum production. No gearing or timing. Simple set-up. Make pull or compression coil springs, to fit the job. Up to 2" arbor, from wire .003 to 3/16", any lead or pitch, any length, right or left hand.

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ment is costly. Easily adaptable to special

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complete with an 8-foot (Underwriters' approved) rubber cord, plus assorted grades of garnet paper for sanding and a felt pad and sheepskin for wax polishing.

### B/W "Hi-Power" Solenoid

Designated as the B/W "Hi-Power," a small space alternating current solenoid which is designed to provide an unusual amount of power when equipped with standard duty coils has been announced



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B/W "Hi-Power" Solenoid

by the B/W Controller Corp., Birmingham, Mich. Said to be ideal for heavy duty service on valves located where ambient temperatures are extremely high, such as near boilers, the solenoid is ruggedly built to provide for long life and service, and is so arranged that colls can be easily changed in the field.

### Hobart No. 90-PL Electrode

Designated as the No. 90-PL, a low hydrogen coated electrode designed for welding high carbon, high sulphur and other hard-to-weld steels without underbead cracking is announced by The Hobart Brothers Co., Hobart Square, Troy, Ohio. According to the manufacturer, the electrode, which provides a smooth and steady arc, thus ensuring good root pen-



You who use abrasive belts and discs . . . you went for our Red Coat Abrasives like a duck takes to water. You bought them like hot-cakes . . . so fast that you made us get another plant . . . just to fabricate Michigan RED COAT Abrasives.

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MICHIGAN ABRASIVE CO. 2360 W. Jefferson Ave. Detroit 16, Michigan



Humidity Controlled Abrasive

etration, has a tensile strength of 94,000 p.s.i., yield point of 85,000 p.s.i., and 26 per cent elongation in 2 inches.

The Hobart No. 90-PL Electrode is available in 32, 1/8, 52, 32, and 1/4-inch di-

ameters for use with d.c. only.

### Warner & Swasey Extra-Heavy Duty Three-Jaw Geared Scroll Chuck

An extra-heavy duty three-jaw geared scroll chuck especially designed for high rates of metal removal is now being produced by The Warner & Swasey Co., 5701 Carnegie Ave., Cleveland 3, Ohio. Made in two styles-with serrated stepalong jaws or with American Standard tongue-and-groove jaws-the chuck is offered in 8, 10, 12, 15, 18, 21, and 24-inch sizes and is designed to fit 6 to 15-inch American Standard flanged spindle noses of any machine.

The chuck body is forged of high carbon steel, and the backplate is cast of high-test iron for good shock-absorbing characteristics. The scroll is machined of alloy steel, hardened to 430 Brinnel. Bronze bushings are provided for longlife protection of wear points. The scroll

is fitted with a renewable bronze hub bushing, and each pinion is provided with two replaceable bushings. In addition, a hardened steel shouldered sleeve is provided at the pinion lug end, resting against the tips of the pinion teeth to take thrust and radial loads.

The pinion and scroll gear teeth are generated on special equipment to avoid uneven load concentration and metal deformation. The pinions are separately dimensioned for each chuck size, and the pinion teeth have a slight "barreled" form to provide maximum bearing efficiency under load.

The serrated jaw chuck has master jaws with limited travel, major adjustments being obtained by positioning the reversible top jaws, which are adjustable in 1/4-inch increments. In this type, the master jaws have dust lugs at the top

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and bottom which are said to positively seal the scroll from dirt and chips, assuring long life and accuracy of the working mechanism.

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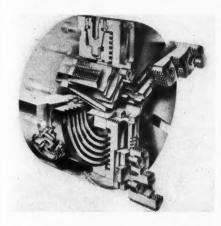
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The American Standard jaw-type chuck has conventional tongue-and-groove type master jaws without dust lugs. Spacer blocks can be provided, however, so that serrated jaws can be used interchangeably in the same chuck body. Six grease fittings provide for adequate lubrication. Lug type pinions are used for the appli-



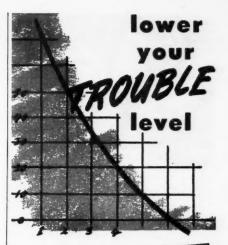
Warner & Swasey Extra-Heavy Duty Three-Jaw Geared Scroll Chuck

cation of power chuck wrenches to obtain maximum usefulness from either type of chuck.

### Elmes "Power-petuator"

A major improvement in small hydraulic press operation is said to be provided by the "Power-petuator," an air-actuated continuously charging intensifier announced by the Elmes Engineering Works, 1002 Fulton St., Chicago 7, Ill. Now standard equipment on all Elmes Hydrolairs, the intensifier is claimed to provide a continuous high pressure stroke and maintain any desired preset ram pressure, even on materials of the compressible type.

Particularly useful in performing laminating and assembly forcing operations, repetitive test work, and other jobs requiring up to 50 tons pressure, the Power-



in on a trial basis for milling high carbon alloy steel. High-speed alloy cutters were used and it was found that SOLVOL increased the cutter life 3 to 4 times over what they had been getting.

operator reported less mist from the precision grinding machine . . . finish improved 2 to 4 micro inches . . foreman and lubrication engineer well pleased."

The above case studies are typical of results being secured with Stuart oils. D. A. Stuart Oil Co. representatives have back of them a tremendous fund of experience and technical assistance. If you are having trouble due to cutting oils you can count on them to minimize the troubles. Write for "Cutting Fluids for Better Machining."

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## B-RIGHT-ON SOCKET SCREWS

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Yes, all B-Right-On Socket Screws are of one quality . . . the highest. Heads are concentric with the threads, which are a uniform No. 3 fit. Sockets are of uniformly correct size. Faces are flat and uniform, points are smooth and perfectly formed.

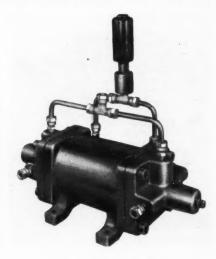
The high, never-varying quality of B-Right-On Socket Screw Products is the reason these "uni-quality" screws are preferred by mechanics and purchasing agents alike.

Send for revised price and size list.

### **BRIGHTON SCREW & MFG. CO.**

READING RD. AT DORCHESTER CINCINNATI 2, OHIO petuator is completely automatic. With press controls in "press" position, it is said to build up working pressure virtually instantaneously. The principle is similar to that of the steam reciprocating engine. Air requirements are said to be negligible.

The Power-petuator is a self-contained unit which can be placed at the rear of the bench type Hydrolairs or in the base of floor types. Ram pressure is set as de-



Elmes "Power-petuator"

sired by means of an air pressure regulating valve. A packless construction is used in order to reduce service troubles to a minimum.

### Van Dorn Improved Portable Electric Polisher

The Van Dorn Electric Tool Co., Towson 4, Md., announces that its portable electric polisher, in both standard and automatic models, has been redesigned to provide for more power and easier operation. In each model, the gearing has been changed to a single reduction spiral bevel gear which is said to increase the motor power approximately 30 per cent and the speed of the motor to 1,500 revolutions per minute.

With the automatic model, "Power Glaze," a cleaning liquid, can be fed directly from a built-in reservoir at the

With it is rirtulate is ating to be ained ar of base is de-

Van Dorn Improved (Automatic Model)
Portable Electric Polisher

handle end by means of a tube through the hollow spindle of the tool to the work. On this model, the pump operation has been improved to include a lever that is said to reduce operator fatigue and to be more readily accessible than the plunger button formerly used.

In both the standard and automatic models, the Van Dorn Improved Portable Electric Polisher is supplied complete with a 7-inch molded rubber pad, 7-inch sponge rubber cushion pad, lambswool buffing pad, rocker-type switch, reversible side handle for either right or left-hand operation, three-conductor cable, and powerful universal motor.

### Knu-Vise Model DTAO-400 Air-Operated Clamp

Intended for use where a clamping support would be inconvenient for efficient production, a unique toggle-action air-operated clamp designated as the Knu-Vise Model DTAO-400 is announced by the Lapeer Mfg. Co., 3056 Davison Rd., Lapeer, Mich. A plier-like grip is produced by the toggle bar, which acts as a supporting member, and the toggle jaw, which does the actual clamping.

In use, both the toggle bar and the toggle jaw can be swung clear out to allow for free removal of work. The supporting pressure of the toggle bar is 400 lb. at the outer rivet, and the clamping pressure of the toggle jaw is approximately 300 lb. at the innner hole. The operating air pressure is 85 pounds.

According to the manufacturer, the Knu-Vise Model DTAO-400 Clamp is double-acting and will maintain its firm grip

## BALDOR BALL BEARING GRINDERS

### **A Complete Line**

— 6" to 12" wheels —
BENCH and PEDESTAL TYPES

### Rugged---for heavy-duty service Precision-built for precision work

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BALDOR Bench Grinder No. 8100 series. Has powerful ½ h.p., ball-bearing motor, 60 cycle, 1700 rpm., 8" x 1" first-grade wheels. Heavy shaft, ¾" arbor.

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January, 1949

MODERN MACHINE SHOP

309



Knu-Vise Model DTAO-400 Air-Operated Clamp

on work even though there may be an accidental failure in air pressure. The clamp, it is claimed, will not release work until air pressure is applied to open the clamp. Restriction fittings are used to produce the proper cushioning effect and avoid hammer-like action when closing or opening clamp. These fittings can be easily removed if not wanted for certain operations.

In the closed position, the clamp has an overall length of 13-5 inches and height of 4½ inches. In the open position, the clamp has a height of 7½ inches and width of 2½ inches. The cylinder may be obtained separately for use independently of the toggle-action clamp for pushing

or pulling or as a means of creating hydraulic pressure. The cylinder has a  $1\frac{1}{2}$ -inch bore and  $2\frac{3}{2}$ -inch stroke. The maximum internal pressure is 250 p.s.i., however, the cylinder is also available to withstand 2,000 p.s.i. The cylinder has an overall length of 6-25/32 inches, height of  $2\frac{1}{16}$  inches, and width of  $2\frac{1}{16}$  inches.

### Modernair CV Control Valve

The development of a solenoid operated 4-way control valve identified as the CV is announced by the Modernair Corp., 4222 Hollis St., Oakland 8, Calif. The valve is available in a %-inch port size with overall dimension of 7½ inches and a %-inch port size with overall dimensions of 10% inches.

According to the manufacturer, the Modernair CV Control Valve is construct-



Modernair CV Control Valve

ed to assure long trouble-free operation and easy servicing. Material subject to contact with operating fluid is non-corrosive; the body is a heat-treated sand cast aluminum alloy casting; the valve piston is solid machined brass sealed with aircraft type O-ring packings which are readily replaceable without disturbing piping connections. Designed for operation on a maximum line pressure of 150 p.s.i., the valve is equipped with coils which are furnished as standard for 110/220-volt use with current consumption on 110 volts of 1 ampere. The valve is also available with 440-volt coils as standard, or coils for 440-volt operation may be obtained and substituted for removing the valve end covers without affecting piping arrangements.

The solenoid coils actuate small secondary valves which, in turn, control air internally ported from the incoming pres-

### "ALL-WAY" LEVEL



The Fell Precision Level shows the level of all directions at once to an accuracy of .0005 inch per foot. It saves time in the manufacture and maintenance of machinery. Made in sizes  $3\frac{1}{2}$ " x 6" and  $5\frac{1}{2}$ " x 12", also 4" and 5" dia. for permanent mounting.

Write for information

WM. B. FELL CO.
320 McLAIN AVE. ROCKFORD, ILL.

sure port. The valve piston is thus forced to the extreme position at each actuation by the injection of positive pressure behind the piston. At the same time, the electrical system is fully protected from contact with the operating air.

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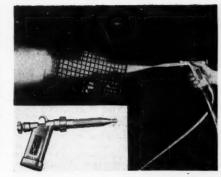
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The design of the Modernair CV Control Valve permits the transmission of full line volume and pressure through the unit, the operation of which is said to be unaffected by normal line pressure variation. The 5-port 4-way construction of the valve permits regulation of either exhaust ports, thus assuring accurate control of the cylinder piston movement. A single solenoid spring return action is readily available.



"Hydro-Air" Pressure Washer

### "Hydro-Air" Pressure Washer

Known as the "Hydro-Air," a pressure washer with a wide range of application to industrial cleaning jobs has been announced by D & M Products, Inc., 4655 Kingswell Ave., Los Angeles 27, Calif. Using a precisely controlled mixture of water and compressed air, the unit produces a blast of "cold steam" that is said to penetrate and clean without back

splash or harm to finish. It is claimed to be particularly effective in the cleaning of motors, chassis, transmissions, aircraft engines, landing gear and plane surfaces, and other parts.

According to the manufacturer, the Hydro-Air Pressure Washer is designed to effect a saving of time and labor in metal processing, maintenance and re-

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● Make the most of your tool maker's time by reducing set-up time on Jig borers, milling machines, slotters, planers, boring mills, punch presses, etc.



Northwestern T nut and stud sets eliminate the time spent looking for correct length studs for each set-up. They are available in sets to fit all machinery.



Northwestern step block sets eliminate time spent looking for hit-or-miss temporary blocks and shims for each set up. Write today for detailed bulletin and selection chart showing various types and size of stud sets which we carry.

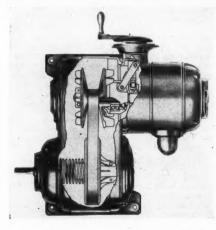
NORTHWESTERN TOOL & ENGINEERING CO.

119 HOLLIER AVENUE DAYTON 3, OHIO pair, and degreasing or paint stripping departments. Through the use of varying adjustments, the washer can be employed to remove heavy dirt and grease or quickly and thoroughly rinse cleaning solvent from sheets and parts.

U. S. Improved Varidrive Motor

An improved variable speed motor which can be quickly and easily adjusted to provide any required speed over a wide range while operating has been added to its Varidrive line by U. S. Electrical Motors, Inc., 200 Slauson Ave., Los Angeles 54, Calif. To change the speed of the motor, the conveniently located control handle is simply turned until the desired speed is obtained. The speed can be increased as much as 700 per cent within a few moments, it is claimed. Once set, any given speed is said to be maintained regardless of load fluctuations.

Referring to the accompanying illustration, as the control handle is turned to the right, the screw and pivoted strut move the sliding Varidisc on the motor shaft toward its companion, thus forcing the V-shaped Varibelt to a larger diameter. Simultaneously, the belt forces the sliding Varidisc on the driven shaft to



Cutaway View of U. S. Improved Varidrive Motor Showing Simplified Construction

react against its spring and permit the belt to operate at a smaller diameter. The speed of the driven shaft is thus increased while the motor shaft is constant. Reduced speeds are readily obtained by reversing the movement of the control handle.

According to the manufacturer, the number of operating parts in the U. S. Improved Varidrive Motor has been reduced to a minimum, resulting in fewer places to wear and cause lost motion, vibration, or loss of efficiency. Only one strut is used between the control nut and shift housing. The motor bearings are properly located to ensure concentricity of the rotor and stator. Since all motor castings are normalized, the vital motor bearings are said to retain their accurate setting for the entire life of the Varidrive unit.

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### Keller "Airfeedrill"

Known as the "Airfeedrill," a tool for multiple drilling is now being manufactured by the Keller Tool Co., Grand Haven, Michigan.

As shown in the accompanying illustration, the tool is available in five sizes which provide for 34 speed combinations of stationary and portable units for drilling holes up to ¾ inch in diameter in mild steel, aluminum, brass, or plastics. The tool is light in weight, weighing from 3½ lb. in the smallest size to 28 lbs. in the largest size.

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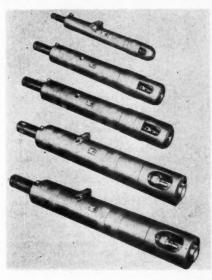
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The Airfeedrill is a combination of a Keller air drill, an air cylinder, and a hydraulic dashpot and feed control assembled in one housing and arranged for quick locking progressively in a jig or permanently into a fixture. According to

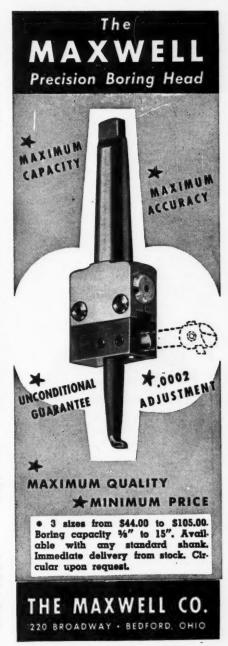


Keller "Airfeedrills"

the manufacturer, the tool provides for maximum speed and accuracy, together with the elimination of operator fatigue, in performing a wide variety of multiple drilling operations. A complete line of bushings and fittings is available for use with the tool.

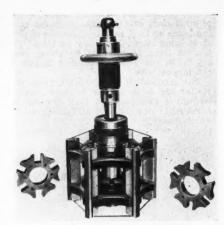
### **Alexander Ball Honing Tools**

The C. Allen Fulmer Co., 1233 First National Bank Bldg., Cincinnati 2, Ohio, has been granted the general distributorship throughout the United States of the Alexander Ball line of honing tools built by George Alexander Machinery, Ltd. The tools are designed to produce round, straight bores to close tolerances and to assure fast stock removal by honing.



According to the manufacturer, Alexander Ball Honing Tools are engineered to provide a wide range of diametrical expansion. On many sizes of tools, flanges in the honing head are removable, and additional flanges are available for replacement in the honing head for increasing the diameter of the tool by 1 or 3-inch increments. The same stone holders and basic honing tool are used with all the proper flange sizes, thus providing for maximum economy in honing a wide range of diameters. The use of the tools does not require highly trained operators to obtain extremely accurate work with fast stock removal, it is claimed. Due to automatic stone compensation, the stones are automatically dressed to an accurately cylindrical surface.

Alexander Ball Honing Tools are made of high grade chrome-nickel steel, hardened and ground to assure maximum operating life. The expansion cones in the workhead are specially hardened, and the expansion pins contacting the cones have a long-line contact to avoid "Brinnelling" under severe loads and fast stock removals. The tools are available in sizes from ½ to 50 inches in diameter in types to finish open bores, ported cylinders, or blind holes, all of which are



Alexander Ball Honing Tool Set Up for Typical Honing Job

equipped with diametrical sizing stops. The tools are also available in a range of sizes for automatic expansion up to a sizing stop that can be set for definite stock removal.

### Hobart "Nickelcast" Electrode

A 100 per cent nickel electrode for producing machinable welds on cast iron without preheating the metal is now being marketed under the trade name of "Nickelcast" by The Hobart Brothers Co., Hobart Square, Troy, Ohio. Welds produced with the electrode are claimed to be machinable both in the deposit and line of fusion.

According to the manufacturer, the Hobart Nickelcast Electrode is free from fluorides and will not produce injurious gases. The coating on the electrode is insulated to prevent arcing when working in confined quarters. The electrode can be used with either a.c. or d.c. and is available in  $\frac{3}{2}$ ,  $\frac{1}{2}$ ,  $\frac{3}{2}$ , and  $\frac{3}{16}$ -inch dimensions.

### **Bonney Wobble Drive Extension**

The Bonney Forge and Tool Works, Allentown, Pa., has announced a wobble drive extension which is designed to enable a mechanic to obtain a small amount of swivel and to work on a bolt or nut with the extension leaning at an angle of approximately 12 degrees in any direction without the use of a universal joint.



BALL BEARING

Used for station drilling and milling; often replacing expensive jigs. Markers enable operator to locate station easily. Also manufacturers of worm and wormwheel operated Rotary Tables—11 models, 8 sizes, 9" to 25".



TROYKE MFG. CO. Cincinnati 9, Ohio, U. S. A.



Bonney Wobble Drive Extension

The male end of the tool comprises a %-inch wobble drive which is designed to accommodate any %-inch drive socket. The other end of the tool comprises a female %-inch square drive for attaching a ratchet, hinge handle, speeder, or Thandle.

The Bonney Wobble Drive Extension is made in two sizes; namely, No. AT4 which is 6 inches long and No. AT5 which is 12 inches long.

### Thompson Series B Commercial Grade Ball Bushing

In response to the demand of original equipment manufacturers desiring a bearing for the support of linear motions in volume p roduced end products, Thompson Industries, Inc., Dept. D. Manhasset, N. Y., has developed a ball bushing designated as the Series B Commercial Grade.

According to the manufacturer, the bushing is built to the same basic dimensions and has the same free-rolling characteristics as the company's Precision Series A bushing used on guide rods, guide posts, reciprocating shafts, and for the support of any mechanism that is moved or shifted in a straight line, although the tolerances on the Series B



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bushing are not as close as on the Series A and the load capacity is somewhat less. Nevertheless, the Series B bushing is claimed to offer the same low friction, elimination of binding and chatter, lasting alignment, and solution to many troublesome linear lubrication problems. The bushing is also said to impart long line and low maintenance to linear moving mechanisms.

The Thompson Series B Ball Bushing employs the unique principle of ball recirculation used in the Series A bushing, thus enabling u n l i m i t e d frictionless linear travel, the manufacturer states.



Thompson Series B Commercial Grade Ball Bushings

Made of case hardened steel parts, the Series B bushing is available in sizes for shaft diameters of ¼, ½, ¾, and 1 inch.

## Simplify AIR CYLINDER CONTROL — Cut Costs

Here's a new approach to air cylinder operation, the Numatics "Unitized Control," which mounts standard, interchangeable valves directly on the air cylinder. It can be applied to old or new cylinders... permits maximum control flexibility. You can select your own control for solenoid, combination of double solenoid, hand, foot, cam or sequence operation.



**NUMATICS** 

100 SOUTH MAIN ST. . MILFORD, MICH.

### J. K. L. All-Purpose Scraper

Said to be ideal for scraping paint spray booths and floors, as well as for numerous other scraping operations, an all-purpose scraper with replaceable blade is being produced by the J.K.L. Manufacturing Co., 1120 11th Ave ... Rockford, Ill. The scraper consists of a 48-inch long grain wood handle to the end of which is attached a heavy gauge welded steel blade holder having three hardened steel bolts, nuts, and washers for locking the blade in position.

The blade is made of high grade tool steel which is tempered for long wear. According to the manufacturer, the blade is designed to hug the floor surface and does not spring away to cause intermittent gouging or skidding. blade is made with slots to provide a firm grip and



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J.K.L. All-Purpose Scrape:

prevent rocking or tipping of the blade in the holder when in use. When used on wood floors the scraping edge is ground square. For all other purposes, the blade is ground with a double bevel. The standard blade has a 6-inch cutting edge. A blade with an 8-inch edge can also be furnished. Where inflammable debris or an explosive atmosphere is present, brass blades can be supplied which

may be safely used without danger of sparks, it is claimed. Moreover, extra replacement handles are available for the scraper.

### "Anglevel" Combination Level and Angle Indicator

Said to be ideal for ascertaining angles, and so on, on bridge struts and braces, the plain and intricate forming of metal and other materials, ascertaining belt and pulley angles, installing shafting, brackets, and so on, patternmaking, structural steel work, setting machinery, and numerous other jobs, a combination level and angle indicator to be known as the "Anglevel" is now being marketed by the R-D Sales Co., P. O. 912, Flint, Michigan.

Usable from all four surfaces, the unit is equipped with retainers into which vials (two horizontal and two vertical) are placed. The retainers are adjustable and can be readily replaced if necessary. The unit is also equipped with a dial indicator having a dial which is made of clear unbreakable plastic, calibrated in degrees (0-360), and graduated in such a manner as to make it practical for use.

## *ABRASIVE*

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BUFFALO 7, N. Y. Keller, George Machy. Co. 1807 Elmwood Ave.

CHICAGO 6, ILL. Marshall & Huschart Machy. Co. 571 Washington Blvd.

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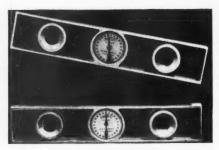
SHREVEPORT, LA. Dixie Mill Supply Co., Inc. 200 Edwards Street ST. LOUIS 8, MO. Blackman & Nuetzei

Machy Co. 3713 Washington Ave. SYRACUSE 2, N. Y. Briggs, C. H. Mach. Tool Co. Inc. Onondaga Hotel Bidg.

W. HARTFORD 7, CT. Rudel Machinery Co., Inc. 7 South Main St.

ABRASIVE MACHINE TOOL CO. EAST PROVIDENCE 14, R. I.

ACCURACY 900515 PRODUCTION



"Anglevel" Combination Level and Angle Indicator

The Anglevel includes a heat-treated aluminum frame 16 inches long x 3 inches wide x  $\frac{\pi}{2}$  inch thick and weighs approximately 1 pound 8 ounces.

### KSM Arc Welding Stud and Arc Shield

An arc welding stud and arc shield for a wide variety of industrial applications are now being manufactured by KSM

QUICK DELIVERY

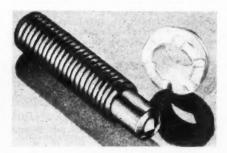
Write for Specification
Sheets and Prices

COLONIAL BUSHINGS, Inc.
P.O. Box 37, Hárper Station, Delroit 13

Products, Inc., 6512 Park Ave., Merchantville, N. J. The stud is produced from steel which is claimed to be highly suitable for stud welding and is threaded by the thread rolling process. The welding end of the stud is reduced to a diameter slightly larger than the minor diameter of the thread to allow the fillet formed in the welding operation to be confined to a minimum diameter consistent with the maximum strength of the stud.

Fluxed by a process which is said to control the quantity of flux in the unit to plus or minus 1 per cent, the KSM Arc Welding Stud is available in a range of standard sizes from ½-20 x ¾ inch to 3 inches long up to and including ½-13 x 1 inch to 3½ inches long in increments of ½ inch in length and ½ inch in diameter. Special studs to meet user specifications can also be obtained, including studs without threads, studs having S.A.E. threads, studs % inch in diameter and larger, collar studs, welding pads, and headed studs.

Available in corresponding sizes to suit



KSM Arc Welding Stud and Arc Shield

the sizes of arc welding stud with which it is to be used, the KSM Arc Shield is designed to shield and control the arc; to permit the escape of gases formed at the site of the weld; and to confine the molten metal so that a compact fillet of minimum diameter is formed at the base of the stud.

### Nu-Matic Grinder Wheel Unit

A power tool wheel unit using standard-type abrasive bands to surface grind or sand curve irregular surfaces or contours, as well as flat areas, is now being manufactured by Nu-Matic Grinders Inc., 10304 W. McNichols Rd., Detroit 21, Mich. The design includes a pneumatic



Nu-Matic Grinder Wheel Unit

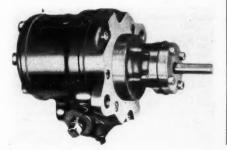
rubber drum inflated at low air pressures (3 to 10 lb.) for adjustment to suit work requirements. The manufacturer states that varied speeds, adjustable drum compression, and the use of a wide variety of abrasive grits provide the unit unusual flexibility and permit an almost infinite variety of finishes to be obtained.

Since the abrasives used are standard and of band type, they can be changed instantly. The rubber drum of the unit is 5 inches in diameter, accommodating abrasive bands 3½ inches wide, is shatterproof, and is constructed for heavy duty and long life, it is claimed. Due to a lightweight aluminum core, the unit weighs only 2 lb. complete. By means of available adapters, the Nu-Matic can be made to fit any power tool shaft.

### Polo Model 15 Gear Pump

Identified as the Model 15, a gear pump which is said to be suitable for supplying oil or coolant, for hydraulic installations, and for general purposes where a small capacity pump is required is announced

Polo Model 15 Gear Pump



## SCHERR aids to precision — production

### Fast and accurate inspection with The comparitol

Where inspection accuracy to "Tenths" and better is absolutely essential in such parts as gages, threads, fine wires, cylindrical ground work, etc., the Scherr Comparitol will give indisputable results. It can be used by anyone with a few minutes instruction, can be placed near machines for constant spot inspection, as well as used for final inspection. Long-lived patented knife-edge mechanism needs no oiling, has no gears, racks, multiple levers, pivots or bearings, no electrical connections, bulbs or transformers. Thousands in profitable use everywhere.



Price, complete with serrated table, 6", \$165. 8", \$185.

### Keep measuring tools accurate with

### OPTICAL FLATS

Essential for checking wear and flatness of lapped surfaces. Reveal deviation in millionths from absolute flatness, or parallelism of micrometer anvil, gage blocks, refrigerator, airplane parts, etc. Sizes up to 4" or over in optical glass. Price, 11/4", \$10.

### A real snap gage service — ATLANTIC Adjustable Limit SNAP GAGES



Made in strict accordance with American Gage Design Committee specifications, Frames of Meehanite. Wide range of sizes, from .195 to 113/4" With round or square gaging pins, solid anvil, extended anvil, etc. The last word in snap gages, and at most interesting prices. Write us for details—and also about the Scherr special service for trueing and setting worn edges.

Write for full details on these and other Scherr tools.

GEO. SCHERR CO., Inc.

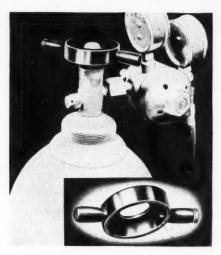
by the Polo Pump Co., S. Division St., Polo, Ill. Designed for direct motor drive at 1,725 r.p.m. at pressures up to 150 p.s.i. with suction lift up to 25 inches of mercury, the pump can be furnished with or without a built-in relief valve and strainer and has a capacity of up to 50 gallons per hour.

The construction of the Polo Model 15 Gear Pump includes heat-treated shaved gears to provide for smooth, quiet operation. The body is cast iron with chrome plated shaft in extra long honed bearing. A shaft seal is provided to prevent leakage around the shaft without packing. According to the manufacturer, the pump is free turning with extremely low friction loss.

### "E-Z-Opener" for Compressed Gas Cylinders

The "E-Z-Opener," a simple quick-opening device which is said to greatly facilitate the opening of compressed gas cylinders, is now being manufactured by N u t m e g Industries, 45 Deacon St., Bridgeport 7, Conn. The device is a onepiece casting which is designed to fit over the standard cylinder valve handle





"E-Z-Opener" for Compressed Gas Cylinders

and can be firmly tightened in place by a knurled set screw.

With the E-Z-Opener in place, the main valve of the tank may be easily turned without recourse to a wrench. Moreover, the device permits the valve to be closed unusually tight with consequent elimination of gas leakage, it is claimed.

### "Quick-Wedge" Screw-Holding Screw Driver

Known as the "Quick-Wedge," a screw-holding screw driver featuring a high grade carbon steel double blade which is hollow ground on the end is now being distributed by Machinery Sales & Equipment, Dept. FH, 3722 Miami Ave., Cincinnati 26, Ohio.

Fitted over the double blade of the screw driver, which is provided with a shock-resistant Tenite plastic handle, is a metal tube with a plastic slide button. As this button is pushed down with the thumb, the two sections of the blade are pressed together so that the blade is wedge-locked in the slot of the screw to be installed, thus permitting the screw to be held, started, and firmly threaded into place. To remove the tool from the screw slot, the slide button is pulled up to the base of the handle, thereby releasing the pressure on the blade sections.

An outstanding advantage of the Quick-Wedge Screw-Holding Screw Driver is



"Quick-Wedge" Heavy Duty Screw-Holding Screw Driver

the fact that it can be readily used to remove, as well as install, screws in deep and other hard-to-get-at holes. The tool is made in three different size shanks; namely, light, medium, and heavy duty.

The light duty is especially adapted for radio, ignition, and telephone work and the smaller setups on electrical equipment. The medium duty is especially designed for use as an intermediate size between the light and heavy duty, partic-ularly on heavier equipment in the electrical field, as well as on all types of instruments and scales. The heavy duty is recommended for all types of industries, machine shops, electrical power plants, or wherever the larger types of screws are used. Sizes of the screw driver range from a 2-inch long blade in the light duty to a 14-inch long blade in the heavy duty type.

### "Twistite" Safety C-Clamp

Known as the "Twistite," a safety C-clamp employing a push-pull design that provides for instant setting of the pressure bar in any position from full open to full closed is now being offered by Richards' Industries, Inc., Grand Rapids 5, Mich. An eccentric spline arrangement enables the operator to lock or unlock the pressure bar with a single twist.

Additional features of the Twistite C-Clamp include a safety roller clutch which is said to prevent frame distortion; ball bearing foot which, it is claimed, cannot creep or mar material held and eliminates twisting; deep throat frame available in malleable or heattreated aluminum in sizes from 2 to 6 inches (larger sizes on request); and spatter-resisting rod, as well as frame.

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Can be used on ANY Milling Machine

A Kempsmith Universal Dividing Head is a precision tool, designed and built to retain accuracy. Combines simplicity and convenience with rigidity and accuracy. High number indexing attachment, spiral cutting mechanism and chuck with adapter also available. Ask for Bulletin No. 119.

Kempsmith Standard Attachments broaden the scope of your milling machine . . . lower capital investment . . . save in set-up time.

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in all popular sizes or types. Adaptable to ANY make of milling machine with standardized spindle.

## KEMPSMITH

Precision Built Milling Machines Since 1888



"Twistite" Safety C-Clamp

If desired, the pressure unit of the clamp can be used without the C-frame in jigs and fixtures.

### "Big Bully" Air Hammer

An air hammer which is designed to deliver 8,000 blows per hour, to be known as the "Big Bully," has been placed on the market by the Superior Manufacturing Co., Dept. 13, 1302 Ontario, Cleveland, Ohio. Intended for heavier types of chip-

DON'T WAIT UNTIL TAPS BREAK OFF - and then wish you had a set of WALTON Tap Extractors Have them on hand for this emergency. Remove **Broken Taps** Quickly and Easily. Write for folder No. 10 and full details of 30 DAY FREE TRIAL OFFER.

THE WALTON COMPANY
Hartford 10, Conn.

ping, scaling, chiseling, grooving, and other jobs in foundries and factories, the hammer has a ¾-inch piston and weighs 3 pounds.

The Big Bully Air Hammer is constructed for one-hand operation by means of a handle which fits the hand like a pistol grip, thus releasing the other hand of the operator for holding or turning the workpiece. By varying the finger pressure on the trigger, the operator can regulate the speed of the hammer from a single light tap up to 8,000 blows per minute. Aside from the metering trigger, the hammer has only one other moving part. According to the manufacturer, no large-volume compressed air equipment is required in connection with the hammer since full speed and power of operation can be obtained on less than 7 c.f.m. at 80 pounds per square inch.

The Big Bully Air Hammer is available with many tool accessories such as a routing chisel, flat scaling chisel, flat chisel, star drill, and spoon face chisel



"Big Bully" Air Hammer

gouge. An 8-foot length of air hose with couplings is included in a kit case especially designed for factory and foundry use.

### Dayton Rogers Special Custom-Made Die-Cut Wrenches

The Dayton Rogers Manufacturing Co., 2524 S. 13th Ave., Minneapolis, Minn., is now offering special custom-made die-cut wrenches in small quantities. Said to be of particular value in the manufacture of special equipment and apparatus where one or more special wrenches are required to be shipped with each piece of apparatus, the special stamped wrenches can be obtained in any desired size up to a maximum length of 20 inches in gauge thickness of from ½ to ½ inch. The



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Dayton Rogers Special Custom-Made Die-Cut Wrenches

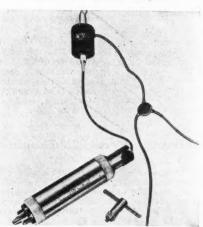
wrenches can be produced from any sheet stock, heat treated, and finished to the user's requirements.

#### L & R No. 17 Radial Handpiece

Identified as the No. 17, a quickly detachable radial handpiece with Jacobs chuck for use with flexible shaft machines is announced by the L&R Manufacturing Co., 577 Elm St., Arlington, N. J. The handpiece consists of a two-piece aluminum housing with two presealed ball bearings and features a No. 0 Jacobs chuck with 0 to ½-inch range.

Constructed to withstand rough con-

L & R No. 17 Radial Handpiece



# Save TIME APS ROUBLE with the New Improved VIKING TAPPER



You save time because the Viking Tapper eliminates the wasting of valuable time by highly paid skilled men trying to tap holes accurately by hand. One fifth the time is required.

You save taps because tap breakage is practically done away with. This enables the use of high speed ground thread taps at lower cost than carbon taps. The savings on taps alone will pay for the tapper in a short time.

You save trouble because Viking Tappers take the trouble out of tapping.
Stand or bench model. Adapters available

in eight sizes.

For Precision Tool Room Tapping use the Viking Tapper. Capacity 1/4" to 7/8".

ILLUSTRATED BULLETIN SENT ON REQUEST.

# THE VIKING TOOL & MACHINE CORP.

2 MAIN STREET,

BELLEVILLE, N. J.

tinual handling, blows against benches, and possible dropping, the L & R No. 17 Radial Handpiece, according to the manufacturer, is cool running and may be quickly attached to the flexible shafting. The handpiece measures  $5\frac{1}{10}$  inches long x  $1\frac{1}{10}$  inches in diameter.

#### Raymac Solid Carbide End Mill

Manufacture of a solid carbide end mill in both single and double-end styles is announced by the Raymac Manufac-



Raymac Solid Carbide End Mill

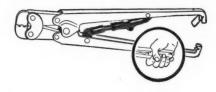
turing Co.. Inc., 3729-17 Cass Ave., Detroit 1, Mich. The solid carbide end mill can be operated at unusually high speeds, thus providing for maximum production, and is designed to provide for long life. Due to the stiffness of the solid carbide shank, the tool, it is claimed, will not mill tapered slots. An additional advan-

tage claimed is that the solid carbide end mill will hold to size over an unusually long period of use, thereby resulting in regrinding economy.

The Raymac Solid Carbide End Mill is machine ground for uniformity and is made with a straight shank only. The tool can be obtained in both single and double-end styles in cutter diameters from ½ to ⅙ inch. Shank tolerances are said to be held from plus 0.000 inch to minus 0.001 inch and cutter head tolerances from plus 0.001 inch to minus 0.001 inch. Special sizes of end mills can be obtained on order.

#### "Certi-Crimp" Solderless Wiring Hand Tool

For wiring applications requiring the installation of solderless terminals by manually operated tools, Aircraft-Marine Products, Inc., 1553 N. 4th St., Harrisburg, Pa., has developed a hand tool that is claimed to eliminate the possibility of faulty electrical connections resulting from operator fatigue or carelessness. Trade named "Certi-Crimp," the tool incorporates a simple effective device which is said to prevent reopening of the tool for



"Certi-Crimp" Solderless Wiring Hand Tool

the admission of a new terminal until it has been completely closed for an accurate crimp on a previous terminal.

According to the manufacturer, operation of the tool is unaffected by the Certi-Crimp feature which is so arranged that it cannot be tampered with or changed without obvious damage.

#### Hexacon Model P212 Electric Soldering Iron

Identified as the Model P212, an electric soldering iron for use on fast production lines where maximum speed is required from an iron with a small tip diameter is announced by the Hexacon Electric Co., 142 W. Clay Ave., Roselle Park, N. J.



Try Them On Your Next Job!

# ECONOMY MACHINE PRODUCTS COMPANY

5212 Lawrence Ave., Chicago 30, III.



Hexacon Model P212 Electric Soldering Iron

Designed for operation on 110 or 220 volts, a.c. or d.c. of any cycle, the iron is of the plug tip type, rated at 200 watts, and is equipped with a 1/2-inch diameter tip which is claimed to reach an unsually high soldering temperature. According to the manufacturer, special provisions have been made in the element construction to

withstand the unusually high temperature developed and to allow for element replacement.

The Select-O-Matic Feed Unit is totally enclosed and consists of 210-tooth ratchet wheel within an aluminum housing containing 32 pawls. (Actually, only one pawl engages the ratchet at any given mo-ment.) The purpose of this number of pawls is to divide the angular increments between each tooth and an adjacent tooth into 32 equal divisions by means of a vernier displacement of the pawl pivots. Mathematically, this means that the angular increments equal 1 5/7 degrees which, when divided by 32, provides a result of 3 minutes. Therefore, when the unit is used in conjunction with a 2-inch

#### "Select-O-Matic" Universal Power Press Feed Unit

A universal power press feed unit which is said to feed coil stock, including brass and steel, through a die to an accuracy of 0.001 inch is now being distributed under the trade name of "Select-O-Matic" by Earl Elwyn Smith & Associates, Dept. MMS, P. O. Box 53, West Hartford 7. Conn. The unit is described as a multi-pawl adjustable ratchet feeding device which is designed to provide for intermittent and unvarying movement of coil stock materials through metal stamping machines as well as punch presses.



MOTO-TOOL KIT No. 2 Moto-Tool No. 2 WITH EMERY POINT \$ 6.50



WITH 23

Moto-Tool Kit No. 2, with 23 accessories (high speed steel cutters, grinding wheels, polishing accessories) and heavy - duty Model 2 Moto-Tool in natural finish, hardwood case ... \$23.50. (Items purchased separately would cost about \$30.00; you save \$6.50.)

Moto-Tool No. 2, with one emery point . . . \$16.50.

SEE YOUR MILL SUPPLY DEALER If he does not handle Moto-Tool, write the factory



dimension is less than 0.001 inch, meaning that the coil stock is fed through the die at an accuracy of less than 0.001 inch. According to the

feed roll, the lineal

According to the manufacturer, the Select - O - Matic Universal P o wer Press Feed Unit can be attached to most general types of punch presses utilizing roll feeds ready for attachment to present punch presses can also be provided.

"Select - O - Matic"

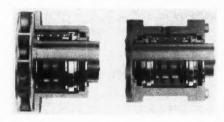
#### Gits "Roto-Flex" Shaft Seal

Designed for ease of installation, a rotating shaft seal known as the "Roto-Flex" has been developed by the Gits Brothers Manufacturing Co., 1845 S. Kil-

bourn Ave., Chicago 23, Ill. The seal is said to be suitable for such applications as water and oil pumps, fuel oil and gasoline pumps, water circulators, refrigeration compressors, speed reducers, and numerous other industrial products.

Claimed to provide a positive seal that prevents leakage of liquids or gases along a rotating shaft when under pressure or vacuum, the Gits Roto-Flex consists essentially of three main components. The rotating member, called the "seal nose," is an integral unit which cannot come apart and is held by a compression spring against the fixed surface or "stationary seal." The operating conditions of the application for the seal determine the amount of spring pressure necessary to make sealing positive and determine the materials used for the lapped wearing surfaces and other component parts.

In addition to the single Roto-Flex, a double unit consisting of two rotating seals mounted on opposite ends of the compression spring is also available. The double unit is designed for installations such as where the liquid being sealed



Gits "Roto-Flex" Single (Left) and

cannot act as a lubricant or coolant and a separate liquid supply is admitted into the seal chamber.

#### Esna Type EB Double Hex Nut

Designated as the Esna Type EB, a high tensile double hex nut which is said to develop 185,000 p.s.i. minimum in N.A.S. high strength aircraft bolts where weight and space limitations are major factors has been announced by the Elastic Stop Nut Corporation of America, 2330 Yauxhall Rd., Union, N. J. Completely interchangeable with existing internal wrenching nuts, the Esna Type EB Nut, as a result of its double hex design, is said to provide for a minimum of weight, as well as an unusually low height.





#### Esna Type EB Double Hex Nut

in any position on a bolt or stud, the nut is available in sizes 1/4 through 11/8 inches in National fine thread series.

#### Palmer-Shile Light Parts Box Hand Truck

An all-steel box type hand truck for handling light parts has been developed by the Palmer-Shile Co., 16022 Fullerton Ave., Detroit 27, Michigan.

The vehicle has four pneumatic tired wheels, the two larger wheels being stationarily mounted. Maneuverability and operating convenience are afforded by the two pivot wheels at the pushing end of the truck. Two hand levers at the pushing end permit the operator to easily unlock the box at the front bottom for parts disposal. Rectangular tubular handles at the top and bottom of the pushing end

Outstanding features of the nut include a nylon locking collar, cadmium plated forged steel body, and bearing surfaces square with the axis of the threads within 1 deg. for nut sizes up to and including ½ inch and ½ deg. for nut sizes 16 inch and larger. Self-locking add to operating convenience and provide a simple means of lifting the truck to empty. The box of the unit is manufactured to user specifications.

#### **B-Line Resilient Mounted Motor**

The addition to its line of B-Line fractional horsepower electric motors of a motor with resilient mounting base is announced by The Brown-Brockmeyer Co., Box 976, Dayton, Ohio. The design features two extra large, square block

### FAST - ACCURATE - ECONOMICAL! that's the EXCEL No. 7

SURFACE GRINDER

EXTRA — F.O.B. BENTON HARBOR

Built to accurately grind tools, dies, chip breakers and for all round toolroom work, the sturdy No. 7 is also capable of handling many production jobs, freeing larger grinders for other work. You'll find this low priced grinder a really profitable investment.

BUILT-IN coolant attachment extra.

Longitudinal travel . . . . 12" Cross travel .......61/8" Chuck Size ...5 3/4"x103/4" Height under 7" wheel..9"

Write Dept. MM-19 for free literature and name of nearest dealer.

DESIGNED AND MANUFACTURED BY

BENTON HARBOR

rubber cushions encased in steel cradles inside the motor end covers to protect them from mechanical damage and deterioration.

According to the manufacturer, the B-



**B-Line Resilient Mounted Motor** 

Line Resilient-Mounted Motor provides a smooth, streamline appearance and design which allows for easy cleaning, and requires a minimum of space for mounting. A high degree of resiliency and silent operation are said to be attained with the motor, thus making it particularly suitable for household appliances

# MARK and DEMAGNETIZE



The Luma combination etchtool and demagnetizer, etches, demagnetizes, anneals and solders. Permanently marks hardest steel with ease of a pencil. Write for complete information.

Luma Electric Equipment Co.
P. O. BOX 132-MS TOLEDO 1, OHIO

such as furnace blowers, unit heaters, stokers, and refrigerators. The motor is available in ratings from 1/6 to % horse-power.

#### Stanley No. 218 Unishear

Designed to cut 18 gauge mild hot rolled steel (other materials in proportion) at a speed of up to 15 feet per minute, the Stanley No. 218 Unishear illustrated herewith is now being marketed by Stanley Electric Tools, New Britain, Conn. The tool, which weighs 4½ lb., features a blade action which is said to "feed in" the work so that little effort is required by the operator to cut straight lines, curves, angles, and notches with hairline accuracy.

Additional features of the Stanley No. 218 Unishear include a full ball and roller bearing construction, automatic lubrication of the plunger from the gear housing, convenient slide-operated switch.

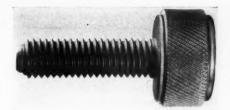


Stanley No. 218 Unishear

and minimum number of moving parts. The tool is furnished complete with a rubber-covered three-wire cable, wrenches, clearance gage, and supply of lubricant, and is designed for operation on 115 volts. The unit can also be obtained for operation on other voltages if desired.

#### Vlier Adjustable Torque Thumbscrew

In response to the demand of industry for a torque thumbscrew that will not only hold at the proper tension during machining but will also enable tool engineers to set end pressures to meet the requirements of various jobs, the Vlier Mfg. Co., 4552 Beverly Rd., Los Angeles 4, Calif., has placed on the market the adjustable torque thumbscrew illustrated herewith. According to the manufacturer,



Vlier Adjustable Torque Thumbscrew

the thumbscrew can be set by the tool engineer for an end pressure of from 5 to

50 lbs. and, once set, the pressure will remain constant under all working conditions.

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The Vlier Adjustable Torque Thumbscrew is offered in two sizes with thread stud of 1/2 x 13/4 inches respectively. The thumbscrew can be quickly and easily set by merely rotating the end plate to the right or left after removing the center screw with a No. 6-32 flat head socket wrench. Rust-proofed and precision machined from properly hardened materials to provide for long and accurate service, the screw is furnished individually boxed with complete operating instructions.

#### 3M "K" Contact Wheel

Identified as the "K." a contact wheel for heavy grinding with abrasive belts at

speeds of 10,000 surface feet per minute or more has been announced by the Minnesota Mining & Manufacturing Co., St. Paul 6, Minn. According to the manufacturer, the wheel provides for unusually fast and cool stock removal, together with chatter-free grinding, and can be used at the maximum speeds of modern equipment.

The 3M "K" Contact Wheel is claimed to be particularly useful in performing such heavy stock removal operations as grinding gates and flashings on castings, cutting down welds, and grinding through scale on forgings. Said to pro-



### IDEAL FOR CARBIDE CUTTERS

Speed with power with precision. PRECISE 40, the fastest, most powerful electric handtool made, weighs only 40 oz. Built for production. Mills, grinds, polishes, deburrs any material from filehard steel to bronze, plastics, wood or rubber. Imagine, with tungsten carbide cutters PRECISE 40 mills the hardest steell

PRECISE 40 in cool, shockproof, plastic case operates on AC-DC. Use it as a handtool or as a motorized quill in vise, lathe, mill or on your produc-

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FOR CIRCULAR

tion set-up. Many accessories and rotary tools available. Also COOLFLEX Flexible Shaft attachment with 9-oz. air-cooled handpiece.

GRINDS MILLS

DEBURRS **ENGRAVES** 

DRILLS

FINISHES

SHARPENS POLISHES

PRECISE PRODUCTS CO., 1345 CLARK ST., RACINE, WIS. U.S.A.

THE NEW PRECISE 40



3M "K" Contact Wheel in Operation

vide for unsually long life even on heavy mechanical operations such as O.D. tube and round bar grinding, the wheel is made in 8 and 16-inch diameters in face widths of 2, 3, 4, and 6 inches, and is designed for use with cloth belts coated with silicon carbide or aluminum oxide mineral grains.

#### Bristol Model IE486 Proportioning Pyrometer Controller

The development of a proportional current-input electronic pyrometer controller designated as the Model IE486 is announced by The Bristol Co., Waterbury 91, Connecticut.

The instrument is designed to proportion the current input to electrically-heated furnaces, ovens, plastic molding machines, salt pots, and other similar equipment to provide for practically straight-line temperature control. This operation is accomplished by time modulation of the input energy, the average energy supplied being proportional to the



Bristol Model IE486 Proportioning Pyrometer Controller

deviation of the temperature from the control point throughout a band width, which is adjustable from 0 to 2½ per cent of full scale reading.

#### "Mighty Midget" Demagnetizer

Small enough to hold in one hand yet claimed to be powerful enough to demagnetize a plate 10 x 8 x 1 inch thick in a few passes, a demagnetizer for surface grinder operators is now being marketed

# GHAZING FOR TAPPING AND REAMING



You'll be amazed at how easy it is to align the work with the spindle if you use a Ziegler Tool Holder which compensates for inaccuracies up to 1/32" on the diameter or 1/16" on the radius.

No wonder the Ziegler Holder is in general use in shops which keep a watchful eye on production costs.

W. M. ZIEGLER TOOL CO.

1928 Twelfth St., Detroit 16, Mich.





"Mighty Midget" Demagnetizer

under the trade name of "Mighty Midget" by Sperman Metal Specialties, 2199 E. 21st St., Brooklyn 29, New York.

The construction of the demagnetizer includes a high permeability coil and a special low carbon pole piece with two working ends, one end for internal work and the other end for flat surfaces.

#### Cleco 3/8-Inch Pneumatic Impact Wrench

The Cleco Division, Reed Roller Bit Co., Box 2119, Houston, Tex., has announced the addition to its extensive line of pneu-

Cleco %-Inch Pneumatic Impact Wrench



# 2-WAYS WITH THIS SWISS JIG BORER!

#### CHECK THESE FACTS:

You Step-up Production, Reduce Costs and get a Higher Quality Product with Finer Finish because this borer is a high-precision Swiss machine. Its automatic features are capable of fine adjustment with highest possible accuracy. Result: increased production, a perfect finish to the closest limits, and longer life for the tools. But this is only one of the ways you save money!

You save money in first cost on this Swiss jig borer because you buy direct from this manufacturer. Not only is this important Swiss tool priced no higher than corresponding domestic tools, size for size and capacity for capacity, but, because this manufacturer maintains its own sales offices in the United States, many extra charges are eliminated, making it possible for you to obtain this precision Swiss jig borer at astonishingly reasonable cost.

Model 4C illustrated, with 18 spindle speeds from 45 to 2,000 R.P.M., provides the correct range for all jobs

up to the maximum drilling capacity of 11/2". Six automatic feeds of the boring spindle from 0.0080" to 0.0080" per revolution operate when rising and descending.

Positive Accuracy — Stabilized measuring screws of special heat treated steel, equipped with corrector bars to compensate for small pitch errors, assure positive accuracy of setting to 0.0002".



# HAUSER MACHINE TOOL CORP.

Representing Henri Hauser, Ltd., Bienne, Switzerland

Get Illustrated bulletin giving complete details

and specifications for this Hauser Jig Borer.

#### MAIL THIS COUPON TODAY!

HAUSER MACHINE TOOL CORP.
Manhasset, N. Y.
Kindly road illustrated bulletin

Kindly send illustrated bulletin giving complete details of Hauser Jig Borer 4C.

Addrass
City......Zone....State.....

matic tools of an impact wrench rated nominally for \(^3\)/-inch bolts. The tool is said to find universal application not only for bolting up and nut running but also for such other jobs as reaming, tapping, stud-setting, and drilling.

Based on a patented principle of impact that eliminates entirely the use of springs and other fragile parts, the tool is reversible, thereby making it applicable for various types of production, assembly, and maintenance work.

#### **AO** Welding Hand Shield

A lightweight, seamless welding hand shield is announced by the American Optical Co., Southbridge, Mass. Recommended for operations where a welding helmet is not practical and on tack welding and set-up work, the small, compact shield is entirely seamless, being made in one piece from special fiber.

The steel welding glass holder of the shield is insulated and rivetless. The fiber handle is 5½ inches long and is firmly riveted to the body. Without glass, the entire shield weighs 11 ounces.

The AO Welding Hand Shield is available with standard Noviweld or Filter-



AO Welding Hand Shield

weld glass plates which are said to ensure eye protection against welding hazards.

#### Lincoln "Softweld" Electrode

Known as the "Softweld," an electrode for depositing dense, soft machinable welds in gray iron castings is announced by The Lincoln Electric Co., Cleveland 1, Ohio. The electrode is described as a non-ferrous type which operates with a soft steady arc on either alternating or direct current.

According to the manufacturer, the Softweld Electrode is designed to cause the weld to flow over and bond to the cast iron with a minimum of penetration and heating of the base metal. The deposit is said to be smooth, dense, and well feathered into the base metal, and the entire weld area may be readily drilled, machined, sawed, or tapped. Its excellent operation on both straight and reverse polarity enables the electrode to be used either to build up an edge in making such repairs as restoring broken gear teeth or filling in holes in defective castings.

Softweld is recommended for use both in original manufacture as well as repairing broken or defective castings and correcting machining errors. The electrode is available in a 14-inch length in 1.8 and 5.32-inch sizes, packaged in 10-lb. containers.



#### Podlin Small Diameter Aluminum Shells

Small diameter aluminum shells produced by an economical process of impact extrusion are now being made available by the Podlin Tool Co., 3920 Wesley Terrace, Shiller Park, Ill. Shells as small as ¼ inch in diameter are obtainable in



Podlin Small Diameter Aluminum Shell

lengths up to six times the diameter. At present, the shells are being made to user specifications only.

#### "Rimat" Microdapter

The "Rimat" Microdapter, an attachment for outside micrometers which is said to make possible the quick and accurate measuring of internal dimensions, has been developed by the Rimat Machine Tool Co., Glendale, California.

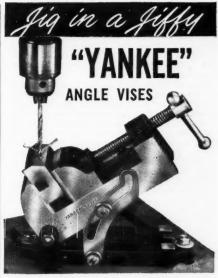
According to the manufacturer, the Mi-



"Rimat" Microdapter

crodapter can be installed or removed in less than one minute and is precision made of all-steel construction. The measuring tips are bright, hardened tool steel, with the remainder of the finish being blue-black.

Please mention MODERN MACHINE SHOP when writing to advertisers. Your cooperation will be appreciated both by this magazine and the advertiser.



Shortcut costs on small jobs with this fast-acting, economical jig. Lock the work in the "Yankee" Angle Vise. Tilt for the angle and lock. You're set up for every operation . . . hand or machine. Also available with quick-release swivel base. Two jaw widths . . . 2" and  $2\frac{3}{4}$ ". Each vise supplied with grooved "V" Block for holding rounds.

#### "Yankee" Ratchet Tap Wrenches

for tight spots

Ratchet needs only slight back and forth movement. Adjustable cross-bar for close-quarter work. R.H., 1.H. and rigid adjustments. Knurled thumb piece for speedy starting in and backing out. Two lengths for 0 to  $\frac{5}{16}''$  taps, one for 0 to  $\frac{5}{16}''$  taps,



WRITE FOR "YANKEE" TOOL BOOK

NORTH BROS. MFG. CO. Philadelphia 33, Pa.

YANKEE TOOLS



THE TOOL BOX

#### New Books

Precision Measurement. By Jack Johnson. Published by Pitman Publishing Corp., 2 W. 45th St., New York 19, N. Y. 181 pages. Illustrated. Cloth binding,

board covers. Price, \$3.00.

In this book, the author has attempted to treat the subject of precision inspection in such a manner as to decisively bridge the existing gap between what is commonly called "school teacher theory" and the practical down-to-earth problems that confront the inspector in his tool work. The problems presented in the text have been drawn directly from the shop, and the accompanying solutions are carried through step by step with the utmost care and simplicity so that no phase of the solution is lost. Through the use of a large number of set-up drawings and sketches, the overall theory behind the solution is, in most cases, clearly and unmistakably shown. The use of balls, discs, or pins in determining the answers to problems is demonstrated.

The formulas presented in the book have been selected as representative of the many problems encountered by an inspector. Each formula is so written as to teach the student how to prepare formulas of his own. In addition to a preface and separate discussions of the elementary principles of trigonometry and squares and square roots, the contents of the book include a total of 57

projects, as well as an index.

Training Employees and Managers. By Earl G. Planty, William S. McCord, and Carlos A. Efferson. Published by The Renald Press Co., 15 E. 26th St., New York 10, N. Y. 278 pages. Cloth binding, board covers. Price, \$5.00.

A major purpose of this volume is to demonstrate that the goals of teamwork and production in business and industry can be best achieved by a training program designed to improve both the skills and attitudes of employees and of managers. In order to develop, illustrate, and justify basic principles which can be applied to all training programs, the scope, objectives, and techniques of the training now being practiced by progressive companies are set forth. By thus subjecting present-day training to a comprehensive and critical examination and by indicating the ever-expanding area of the field, it is the aim to present a useful guide to directors of training and all those actively engaged in training work; to executives, managers, and directors of personnel and industrial relations; and to students preparing to enter management, personnel, or training fields.

The book is divided into three parts. Part I introduces the broad concepts which have developed in recent years in the field of business and industrial training. It answers the questions of executives, managers, and others who want to know specifically what training is and what it will do in return for its time, trouble, and cost. For those already in training and personnel work Part I will summarize the objectives, breadth, and

significance of the field.

Part II deals with the organization and administration of training, and is designed primarily to assist those who are responsible for setting up a training department, selecting and training a staff, and planning the operation of the program.

Part III is devoted to training programs and methods and is chiefly for training directors and for managers who are responsible for carrying out the training program. Dealing with practical operations, this section tells how to do the job. Recommendations are supported by examples chosen from successful training programs in business and industry.





Production Engineering. By J. S. Murphy. Published by The Louis Cassier Co., Ltd., Dorset House, Stamford St., London, S. E. 1. 226 pages, 8% x 5% inches. 99 diagrams and photographs. Cloth bound with jacket. Price, 12/6d (approximately \$2.50 U. S. currency).

This book is intended for students of production engineering and young planning engineers, the purpose being to provide an insight into the various systems of production planning and control. Fully illustrated by 99 diagrams and photographs, this work is based entirely on the practical experience of the author in

the production field and on lectures delivered by him over a period of many years to students and apprentices. Treatment of the subject is general rather than particular, and is concerned with basic principles which can be adapted to local conditions as required.

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The subject of factory organization is a complete sequence of many functions, beginning with the idea of manufacturing something and concluding with the completed product ready for delivery. In this book the aim has been to break down the subject of production planning into its separate items or functions, and to deal with each in the order in which it arises in practice. Practical aspects of production planning and production office routine are also presented.

The contents of the book are headed as follows: Planning a Production Program; Design for Production; Drawing Office Organization; Process Layout; Manufacturing Processes and Methods; Jigs, Tools and Fixtures; Workshop Layout and Organization; Production Control; Time and Motion Study; Estimating and Costing; and Index.

Practical Considerations in Die Casting Design. Published by The New Jersey Zinc Co., 160 Front St., New York 7, N. Y. 246 pages. Illustrated. Cloth binding, board covers. Price \$3.00.

This volume is devoted primarily to the



discussion of specific designs and applications of die castings—of all alloys now in use—and to the practical considerations involved in their design. Well illustrated throughout, the contents of the book comprise 15 chapters as well as a

bibliography and index.

The chapters are headed as follows: General Considerations in the Design of Die Castings; Section Thickness; Where Intricacy Is an Asset; Ribs, Fins, Beads and Bosses Add to Utility of Die Castings; Cores Are Assets in Die Casting; When to Use and When to Avoid Undercuts; Fillets and Edges; Wheels, Gears and Cams; Where and Vhy Die Cast Threads Are Used; Fastening Expedients; Inserts in Relation to Die Casting Design; How Design Affects Flash Removal Costs; Piercing and Forming Possibilities; How Design Influences Polishing Costs; Appearance Factors, Including Decorative Features and Lettering.

Cobalt. By Roland S. Young. Published by Reinhold Publishing Corp., 330 W. 42nd St., New York 18, N. Y. 181 pages. Illustrated. Cloth binding, board covers. Price, \$5.00.

This book is written for two classes of

readers: (1) the chemist, or other scientific worker, who has occasion to work with cobalt and desires accurate, up-to-date and complete information; and (2) the chemist or metallurgist who wishes to browse through this field in the hope of adding to his general knowledge or picking up ideas which may be applicable to his own sphere of work. In attempting to define clearly the present limits of our knowledge on cobalt, the author has tried also to point out promising lines of investigation.

The contents of the volume, which deals v. th cobalt from the standpoint of the mining engineer, geologist, metallurgist, chemical engineer, electrochemist, physicist, biochemist, soil technologist, and analytical chemist, are divided into 13 chapters which are headed as follows: Historical and General; Occurrence of Cobalt; Metallurgy of Cobalt; Chemical Properties of Cobalt: Physical and Mechanical Properties of Cobalt; Cobalt in Ferrous Alloys; Cobalt in Nonferrous Alloys; Cobalt in Powder Metallurgy; Electroplating of Cobalt; Cobalt Compounds in the Glass and Ceramic Industries; Catalytic Behaviour of Cobalt; Biological and Biochemical Relationships of Cobalt; and Analysis of Cobalt. The book also contains an author and subject index.

Turning and Boring Practice. 3rd edition. By Fred H. Colvin and Frank A. Stanley. Published by McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York 18, N. Y. 531 pages. Illustrated. Cloth binding, board covers. Price, \$4.75.

This volume is said to provide a complete guide for everyone interested in the operation of machines used in turning and boring practice. It presents the essential principles and major problems involved in the different operations; describes the more important varieties of machines and methods of operating them; and includes data on speeds and feeds, new cutting alloys and materials, the use of coolants, and so on.

All of the material presented is claimed to be from authoritative sources. Included are such topics as large boring operations, carbide tools on steel forgings, boring and threading in a lathe, three ways to turn contours, turning and boring plastics, machining aluminum, and so on. In addition, the book contains numerous ideas and suggestions to save time, materials, and money and covers hundreds of tested shop practices to make the difficult jobs routine.



Your Creative Power. By Alex Osborn. Published by Charles Scribner's Sons, 597 Fifth Ave., New York 17, N. Y. 375 pages. Cloth binding, board covers. Price, \$3.00.

Each of us has two thinking minds—a so-called judicial mind and a creative mind. This book sets forth approximately 100 ways to make our creative mind do more for us. The style is eminently readable, the ideas understandable.

"Your Creative Power" tells you why you should be, and how you can be, more creative; how a man can use his imagination to get ahead in business; and how

both men and women can use ideas to brighten their own lives and the lives of those about them.

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The Prevalence of Incentive Wages in Wisconsin. By William H. Mayer and William H. Keowen. Published by Bureau of Business Research and Service, University of Wisconsin, Madison, Wisconsin. 41 pages. 11 tables. Price, \$1.10.

This report is another of a series of research bulletins issued by the University of Wisconsin under the direction of Dr. Russell L. Moberly, professor of commerce and director of the Industrial Management Institutes. The study comprises a survey of incentive practices in 163 companies in Wisconsin employing 128,250 production workers, 54 per cent of whom are being paid on an incentive basis. Types of incentive systems are described with a breakdown by industry and by size of company.

Drilling and Surfacing Practice. 3rd edition. By Fred H. Colvin and Frank A. Stanley. Published by McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York 18, N. Y. 523 pages. Illustrated. Cloth binding, board covers. Price, \$5.00.

Contained in this volume are data on today's most efficient practices in drilling and surface operations. The book illustrates and explains how to drill, ream, tap, plane, shape, slot, mill, and broach according to the most advanced methods. All information is presented in a simple, clear-cut, up-to-date manner and includes methods, suggestions, and illustrations



from the leading shops in the country.

In this revised edition are new data on drills of various sizes, new tables on step-drilling dealing with the use of deep taper pins, and information on new designs and uses for reamers and taps. Improvements in the field of milling machines are discussed, covering the newer types of carbide and high speed steel cutters.

The contents of the book are conveniently divided into several sections which are headed as follows: Drilling, Reaming and Tapping, Planers and Shapers, Mil-

ling Cutters, and Broaching.

"Foremanship — A Practical Guide." According to the National Metal Trades Association, the final units of "Foremanship—A Practical Guide" have been published, completing the association's guidebook for factory supervisors. Written to meet the need for a book which could be used as a working tool for the continuous training of supervisors, junior executives, understudies, and key men in manufacturing companies, the volume, which comprises a series of 52 individual conference units, is also said to be useful as a guide to the preparation of shop talks.

facturing companies, the volume, which omprises a series of 52 individual conserence units, is also said to be useful as guide to the preparation of shop talks. The 52 individual conference units are

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of four pages each, on durable paper, with each unit covering one subject of prime importance in factory management. Subheadings are numerous so that any topic can be easily located. Each page is printed with generously wide margins, allowing plenty of space for personal notes. The 52 conference units and a complete index are bound in an embossed ring-binder.

To aid plants in carrying out their own supervisory training programs, the N.M.T.A. has published a companion volume called the "Conference Leaders Manual." "Foremanship" contains the facts and the "Conference Leaders Manual" shows the most successful methods for using them. The publications are being made available to management generally. "Foremanship at \$15.00 per copy and the "Conference Leaders Manual" at \$7.50 per copy can be obtained from the

National Metal Trades Association, 122 S.

Michigan Ave., Chicago 3, Illinois.

Design for Welding. A designer's approach to the problem of design of a new product must necessarily be based upon an understanding of already-existing, proved design techniques. To this knowledge, however, must be added whatever originality the designer possesses in order to produce a product that will have superior features.

Inasmuch as the place of welded construction is assuming an ever-increasing importance in the field of basic design, The James F. Lincoln Arc Welding Foundation, Cleveland 1, Ohio, has issued a booklet which is intended to be of assistance to the designer who is considering welded construction. Beginning with a chapter on What Designers Should Know, the reader is carried through discussions on Design Approach, Originality in Design, Which Welding Process, Butt and Fillet Welds, Cost as a Factor, Castings and Forgings, Formed Metal Parts, Selection of Materials, Stresses and Welded Structures, Relation of Welds to Joint Members, Design to Save Weld Metal, Distribution of Welded Structures, Welding to Save Time, Simplified Design, Welded Gears, Generator Frames, Machine Tools, Food Machinery, and Welding for Functional Use.

T. B. Jefferson, who is author of the booklet, has anticipated practically every question that could arise in connection with the consideration of welded construction and has done an excellent job of presenting the discussion. Copies are available free to engineers and executives.

#### New Shop Literature

Handbook of Industrial Instrumentation. To keep pace with the greatly accelerated interest in instrumentation and automatic control and to augment information published in the technical and trade periodicals, the Technical Section of The Brown Instrument Co., Philadelphia 44, Pa., has undertaken the preparation of a perpetuating loose-leaf Handbook of Industrial Instrumentation. Hundreds of industrial instrument applications will be taken up—one at a time.

Each application will be described on a separate sheet or two-page folder, depending upon the scope of the subject. These sheets or folders, identified as Instrumentation Data, will be coded according to the U.S. Government Classification of Industries and will be punched for convenient notebook filing. The sheets will be prepared by engineers in a strictly engineering fashion and will be devoid of commercialism.

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"Select-O-Matic" Power Press Feed Unit is the subject of a bulletin now being issued by Earl Elwyn Smith & Associates, Dept. MMS, P. O. Box 53, West Hartford 7, Conn. The bulletin explains how the unit enables coil stock to be fed through dies at an accuracy of less than 0.001 inch. Also available are data on complete roll feeds, back to front and side roll types. Copy of the bulletin is available free to interested individuals upon request.

SKF Pillow Blocks. SKF Industries, Inc., Erie Ave. at Front St., Philadelphia 34, Pa., has issued an abridged edition of its general catalog on ball and roller bearings which includes a special section dealing with the various types and sizes of pillow blocks manufactured by the company and data on their mounting, lubrication, and maintenance. The 76-page catalog devotes considerable space to such engineering principles as load calculation, selection of shaft and housing tolerances, and conversion tables. Copy is available to interested individuals upon request.



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#### METAL CUTTING BAND SAWS

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Contour Forming. A 12-page illustrated catalog which fully describes the contour forming of difficult curved metal parts in lots from 100 to 100,000 pieces with constant part-to-part accuracy has been prepared by The Cyril Bath Co., 6988 Machinery Ave., Cleveland 3, Ohio. Copy free upon request.

Ajax Submerged Electrode Furnace designed for the salt bath heat treatment of work of unusual length in a temperature range of from 300 to 2,400 deg. F. is illustrated and described in a four-page bulletin issued by the Ajax Electric Co., Inc., Frankfor<sup>2</sup> Ave. at Delaware Ave., PhilaZeiphia 23, Pa. Copy of Bulletin 122 free upon request.

Metron Hand Tachometers. A four-page two-color bulletin illustrating and describing electric hand tachometers and accessories for accurate speed measurements is announced by the Metron Instrument Co., 432 Lincoln St., Denver 9, Colo. Ranges and prices are listed and typical applications shown. Copy of Bulletin No. 103 free upon request.

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THE RONALD PRESS COMPANY 15 East 26th St., New York 10 "Kutmore" Hollow Mills. An eightpage two-color catalog issued by Carl
Wirth & Son, Inc., Rochester, N. Y., illustrates and describes high speed adjustable hollow mills available in types
for small automatic screw machines, light
and heavy duty hollow milling work, and
intermittent cutting or hollow milling of
square stock. Resharpening fixtures for
hollow mill blades are also covered. A
separate price list of the various mills
is included in the catalog. Copy of Cataiog No. 20 free upon request.

Hydro-Solv "A," a product for removing gum, sludge, and other efficiency-reducing contaminants from hydraulic systems, as well as for cleaning gear units, is described in a four-page two-color illustrated bulletin issued by the Swan-Finch Oil Corp., RCA Bldg., W. New York 20, N. Y. Complete instructions for the use of the product are included. Copy free upon request.

"One-Two-Three" is the title of a sixpage three-color folder issued by the Stonhard Co., 500 Stonhard Bldg., 1306 Spring Garden St., Philadelphia 23, Pa., which illustrates and explains how industrial floors can be made smooth and safe in three easy steps using Stonhard Stonfast resurfacing material. Copy free upon request

Improved Variable Speed Motors. Presentation of new model U.S. Varidrive Motors is made in a colorful and factful bulletin issued by U. S. Electrical Motors, Inc., 200 E. Slauson Ave., Los Angeles 54, Calif. The Varidrive, which enables a machine operator to obtain infinite speeds, is shown in natural colors in different capacities. The 16-page bulletin is attractively compiled and shows in dramatic form how a variable speed motor can be applied to numerous operations to reduce operator fatigue and appreciably increase production. Interesting graphs and illustrations show ways in which variable speed can be used with savings in manhours and in obtaining maximum production. A diaphanous view of the Varidrive shows the operating principle of the motor. Supplementary drawings in full color detail major inmprovements in design.

Copy of the bulletin is available to mechanical executives addressing requests on their company letterheads.

Standard Taper Key Drive Spindle Nose, now a feature of all LeBlond Regal lathes, is covered as to advantages, specifications, and so on, in a four-page twocolor illustrated bulletin prepared by The R. K. LeBlond Machine Tool Co., Cincinnati 8, Ohio. Copy of Bulletin SN-1 free upon request.

GRC Zinc Die Castings. A four-page two-color bulletin released by the Gries Reproducer Corp., Sales Development Division, 780 E. 133rd St., New York 54, N. Y., explains how many small parts and assemblies can be economically produced by the company as integral small die castings. Illustrated with typical small parts, depicting the versatility and diversity of the firm's automatic production facilities, the bulletin also contains several informative charts, including a chart showing the approximate dimensional and weight limits for GRC small zinc alloy die castings, a chart listing the composition and properties of zinc alloy for die castings, and a comparison table intended as a guide for quick reference to the engineering and cost aspects of the GRC die casting process as compared to other methods of manufacture. Copy free.

"The Wheels of Industry" is the title of a four-page two-color illustrated folder issued by The Sterling Grinding Wheel Division, The Cleveland Quarries Co., Tiffin, Ohio, which presents specifications for cut-off and snagging operations—stand, swing frame, and portable. Copy free upon request.

"Here's What's Below The Surface" is the title of a four-page two-color folder published by The Heald Machine Co., Worcester 6, Mass., which illustrates and describes the Heald Vertical Column Rotary Surface Grinder, including its various construction features and advantages which allow for concave or convex grinding. Copy free upon request.

Bridgeport Time-Saving Set-Up Tools, comprising adjustable table straps, adjustable ladder blocks, adjustable end clamps, adjustable table jacks, and slot nuts, are shown, described, and covered as to specifications and prices in an eight-page two-color catalog published by the Hardware Manufacturing Co., 1969 North Ave., Bridgeport 4, Conn. Copy free upon request.

# Need FINE PITCH BEVEL GEARS?

Experience and skill are heavy factors in correctly producing fine pitch straight bevel gears. Teeth with proper bearing—minimum runout—accuracy of form and bevel—all of

these involve special experience which Beaver Gear Engineers have gained in developing straight bevels up to 64 D.P., and finer in some cases. Highly specialized production methods and inspection equipment insure gears made to exact specifications.

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Rote-Finish. A 16-page two-color book-let illustrating and describing the Rote-Finish method of mechanical deburring and finishing has been published by The Sturgis Products Co., Sturgis, Mich. The use of the method is explained in detail, with complete coverage provided on the four principal procedures which make up the process — deburring and grinding, polishing, Britehoning, and coloring. Copy of the book-let is available free to individuals addressing requests on their company letterheads.

Bristol Socket Screws. A 36-page catalog describing both hex and multiplespline socket screws has been published by The Bristol Co., Mill Supply Division, Waterbury 91, Conn. The catalog contains considerable helpful engineering data and information on the correct application of socket set and cap screws and on stripper bolts and pipe plugs. Included are illustrations of the styles available and detailed data on sizes, dimensions, prices, shipping weights, and specifications. Copy of Catalog No. 854 free upon request.

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Pyott Pulleys. A 12-page catalog presenting illustrated, descriptive, and complete tabular data, including list prices, on the various types of pulleys which can be produced by the company is now being distributed by the Pyott Foundry & Machine Co., 328 N. Sangamon St., Chicago 7, Ill. Copy free upon request.

"Repeat Orders Are Positive Evidence of Customer Satisfaction" is the title of a four-page bulletin released by the Walter Maguire Co., Inc., 330 W. 42nd St., New York 18, N. Y., discussing the application and performance of "Emeri-Crete" Flooring in several large firms in the manufacturing, railroad, and other fields. Copy of Bulletin K-801 free upon request.

Balas Collets. The Balas Collet Manufacturing Co., Dept. F, 3800 Woodland Ave., Cleveland 15, Ohio, announces the publication of a 16-page two-color catalog containing complete information on its line of automatic collets, pushers and pads, turret lathe collets and pads, and lathe and milling machine collets. Two important advantages which are said to be pointed out by the catalog are that (1) all automatic collets have felt holes drilled and are furnished complete with felts inserted; and (2) all external collet threads are protected by a plastic film, thus eliminating the possibility of damage to threads before usage. Copy of Catalog No. 48 free upon request.

Mechanite Metal. The Mechanite Metal Corp., Pershing Square Bldg., New Rochelle, N. Y., has prepared a bulletin entitled "Design Data Formulas and Charts for Computing Maximum Stresses in Angles, Ribbed Plates, and Shear Resistant Webs Containing Cut Outs." The second publication resulting from extensive design research, the bulletin contains 19 pages of formulas and charts on the subject and is accompanied by a supplement which provides typical examples of applications of the data with specific references to the bulletin contents. The examples are in the form of proposed problems and their solution.

Copy of Bulletin No 27, together with supplement, is available free upon re-

quest.

Solder Bulletin. Points to consider in determining solder grade and size for a given job, melting points and feet per pound of various sizes and grades, together with other information of value to solder users, are presented in a bulletin issued by the Division Lead Co., Dept. 230, 836 W. Kinzie St., Chicago 22, Ill. Also included are four-color illustrations of the unique solder-saver "snapon" metal covers used on Divco one-pound solder spools to protect the solder from dents and abrasions, keep it bright and clean, and prevent uncoiling and waste. Illustrations and descriptions of

the improved Divco Acid Core Solder with Non-Liquid Flux and Divco Rosin Core Solder with Rosin
Dimer Flux are also contained in the
bulletin. Copy free
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"New Horizons with Microcasting" is the title of a 16page booklet published by Austenal Laboratories, Inc., which contains many interesting examples of parts produced by the "Microcast" process for leading manufacturers. The booklet is fully illustrated and, in addition, lists parts suitable for quantity production by the process, well as the range and type of alloy. Physical and chemical properties of Vitallium castings produced by the Microcast process are also given.

Copy of the booklet may be obtained by writing to Austenal Laboratories, Inc., 715 E. 69th Pl., Chicago 37, Ill., or 224 E. 39th St., New York 16, New York. Etteo-Emrick Tapping and Threading Attachments. A six-page bulletin fully describing its line of Etteo-Emrick Tapping and Threading Attachments for drill presses has been issued by the Etteo Tool Co., 594 Johnson Ave., Brooklyn 6, N.Y. The bulletin lists the seven sizes of attachments made by Etteo for No. 0 to %-inch taps and No. 6 to %-inch dies. Included are prices and details of speed, capacities, and construction, as well as a table to simplify the selection of quill clamps to be used with the attachments on any standard drill press. Copy of Bulletin No. 22 free upon request.



WALTHAM 54, MASS., U. S. A.

Taylor-Winfield Motor-Driven Type ENB Press Welders for precise spot and projection welding service are fully illustrated and described in an eight-page two-color bulletin published by The Taylor-Winfield Corp., Warren, Ohio. Specifications and other data are conveniently listed. Copy of Bulletin 3-123 free upon request.

Snyder Special Machine Tools. A twocolor mailpiece now being distributed by the Snyder Tool & Engineering Co., 3400 E. Lafayette St., Detroit 7, Mich., illustrates and describes several special machine tools, including a vertical type machine which is designed to perform three to twelve operations with a wide range of tools: a machine for drilling and line boring cross shaft holes in 70 sizes and types of clutch housings; a machine for center drilling and facing 444 piston heads an hour at 85 per cent efficiency; a machine for automaticaly inserting 12 rivets in an automotive wheel assembly; and a transfer type 13-station machine which is designed to drill, ream, spotface, tap-drill, core-drill, countersink, saw, and tap automotive manifolds. Copy free upon request.



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Allis-Chalmers C o o l a n t Circulating Pumps, including foot mounted, submerged, and side-wall mounted models, are illustrated and described in an eight-page two-color bulletin released by the Allis-Chalmers Mfg. Co., 1010 S. 70th St., Milwaukee 1, Wis. Construction details and application information are presented for each of the eight types, together with dimensions, head capacity, motor frame, pipe friction and valve and fitting flow resistance tables. Copy of Bulletin 52B6975 free upon request.

Atlas No. 5010 Belt and Disc Sander for the efficient and economical sanding of small metal, wood, and plastic parts is illustrated and described in a four-page two-color folder published by the Atlas Press Co., 2346 N. Pitcher St., Kalamazoo 13D, Mich. Specifications of the unit are included, as well as illustrations and brief descriptions of accessories available for the machine. Copy free.

"Radiac" Mounted Points and Mounted Wheels are featured in a 24-page three-color pocket-size catalog published by A. P. de Sanno & Son, Inc., Phoenixville. Pa. The catalog commences with a full description of the advantages, grain sizes, and grades of Radiac Mounted Points and Wheels and then follows with complete ordering information, including illustrations showing the various shapes and dimensions of the wheels and points. List prices of the various products are conveniently presented on the last few pages of the catalog, copy of which is available to mechanical executives addressing requests on their company letterheads.

Sheldon Catalog G-48. The Sheldon Machine Co., Inc., 4258 N. Knox Ave., Chicago 41, Ill., has issued a 16-page twocolor catalog which describes, illustrates. and presents detailed specifications on lathes, shapers, milling machines, accessories, and attachments. An advantage of the catalog is that it is so arranged that illustrations, descriptions, and detailed specifications are, in every instance, on the same or facing pages, obviating all need for cross references. A total of 52 types and models of precision lathes, shapers, and milling machines are covered, as well as over 70 accessories and attachments. Copy of Catalog G-48 free upon request.



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dollars for a magazine subscription.

That's just one reason advertisers get such profitable results from MODERN MACHINE SHOP. RESULTS TELL THE STORY. Gardner Publications, Inc., Cincinnati 2, Ohio.



Wilson Arc Welding Electrodes. A 40page catalog containing 50 illustrations and diagrams, an electrode selector chart, and complete details on all of the electrodes in the company's line has been announced by the Wilson Welder & Metals Co., Inc., 60 E. 42nd St., New York 17, N. Y. In addition to a general description of the electrodes, the catalog presents data on application, welding procedure, mechanical properties, and specifications. Copy free upon request.

"Contour Sawing Hard Metals and Vitreous Materials with Newly Developed Diamond Band Sawing Machine" is the subject of a four-page illustrated technical report prepared by the DoAll Technical Institute. Photographs and text graphically describe how extremely hard and friable materials and hardened metals can be cut directly to layout lines whether straight or curved by using a new diamond band sawing machine. The information presented covers the design of the diamond-studded band saw, the sawing machine, and its accessories. Reprints of the report may be obtained upon request to The DoAll Co., Des Plaines, Illinois.

South Bend Precision Drill Press in both bench and floor models is illustrated and described in a 7 x 10-inch eight-page catalog issued by the South Bend Lathe Works, 386 E. Madison St., South Bend 22, Ind. Also illustrated and described are motors, controls, extra spindles, and other drill press accessories. In addition, complete specifications and prices are listed, and diagrams are presented to show all important dimensions of the drill presses. Copy of Catalog No. 400 free upon request.

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Aero Spiral flute HSS Co-sinks end chatter, cut clean and accurately. Stocked in 60, 82, 90, 100 degree included angle, %", "y," diameter, with "y," shank and "k", and 1" dia. with "y," shank. If not available from your Mill Supply dealer order direct.

AERO TOOL COMPANY 6930 Avaion Bd., Los Angeles 3, Calif. Simmons Quick-Lock, Spring-Lock, and Lock-Nut Fasteners, products of the Simmons Fastener Corp., 1769 N. Broadway, Albany 1, N. Y., are illustrated and described and depicted in typical applications in a four-page two-color bulletin issued by this firm. Copy free upon request.

Martin Series 20 Adjustable Die Enclosure Guards for the protection of operators in performing blanking, punching, strip-feeding, and similar types of first-operation work on punch presses are fully illustrated and described in a two-color folder published by W. I. Martin & Co., 711 S. Dearborn St., Chicago 5, Ill. Included is information on sizes, prices, optional special features, and ordering. Copy free upon request.

Geometric Class S Collapsing Taps for practically any machine and internal threading job 1% inches in diameter and larger are illustrated and described in a four-page two-color bulletin released by The Geometric Tool Co., New Haven 15, Conn. The various features of the taps are clearly explained, and a table of complete specifications is included, together with a list of parts comprising the Class S taps. Copy of Bulletin S-4 free upon request.

AMC Demagnetizer, product of the Alofs Manufacturing Co., 1615 Madison Ave., S.E., Grand Rapids 7, Mich., is illustrated and described in a six-page two-color bulletin prepared by this firm. General specifications of the two standard sizes in which the demagnetizer is available are presented, as well as directions for demagnetizing and magnetizing parts. Copy free upon request.

Republic Union Cold Drawn Steels. A 28-page two-color booklet describing cold finished steel bars has been published by the Union Drawn Steel Division of Republic Steel Corporation. Included is information on typical uses and mechanical properties of the types of steel bars most frequently used, including machining grades of stainless, as well as data on commercial finishes, sizes, and tolerances.

Copy of the booklet may be obtained by writing to the Republic Steel Corp., Republic Bldg., Cleveland 1, Ohio.

"The Best of Everything for Metallizing" is the title of an eight-page twocolor catalog issued by the Metallizing
Engineering Co., Inc., 3814 30th St., Long
Island City 1, N. Y., presenting its complete line of metallizing equipment and
supplies. Illustrated and described are
metallizing guns for various purposes,
air and gas controls, spray booths, dust
collectors, blast machines and nozzles,
air compressors, and special metallizing
wires. Introduced are three new accessories; namely, a wire control and
straightener unit for increasing spraying
speeds and reducing gun wear, a gas

flow meter unit, and an air control unit. Copy of catalog 401 free upon

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"Verson Die Manual - A Handbook of Press Brake Dies, Punching Attachments and Press Brakes" is the title of an attractive and durably bound 88-page book issued by the Verson Allsteel Press Co., 9310 S. Kenwood Ave., Chicago 19, Ill. Over 200 press brake dies are illustrated and described ranging from simple bending dies to complex gang punching units. Related die types are grouped together with descriptive text which discusses their uses. advantages. and limitations. Detailed information is presented to simplify tooling up and to help avoid the dangers of misapplication of dies. Also included are useful engineering data for making metal forming calculations and complete details and specifications on Verson Press Brakes. Copies are available without charge to all persons engaged in the forming of metals.

Go & Go Standard Cutters. The Goddard and Goddard Co., Detroit 23, Mich., now has available a four-page two-color bulletin presenting illustrated, descriptive, and tabular information, including list prices, on standard high speed steel inserted blade end mills, face mills, and straddle mills. Copy of Bulletin No. 116 free upon request.



You, Too, Can Reduce Costs, Improve Product, and Speed Up Production" is the title of a six-page two-color folder issued by The Fostoria Pressed Steel Corp., Fostoria, Ohio, which discusses the advantages of Fostoria Infra-Red Evenray Systems and illustrates and describes typical installations of the systems for infra-red processing metal and other types of parts and products in a wide variety of industries. Copy free upon request.

"Precision Investment Casting" as a means of cutting production costs is covered in a four-page two-color bulletin issued by the Allis-Chalmers Mfg. Co., S. 70th St., Milwaukee 1, Wis. Illustrated are 24 sample parts ranging from a stainless steel thermometer clamp for the dairy industry to bronze bearing blocks for a high speed precision camera. The bulletin also supplies answers to numerous questions on precision casting, such as the type of materials that can be cast, the closeness to which tolerances can be held, the limit to the shapes and designs that can be cast, physical properties, and so on. Copy of Bulletin 19B6451A free upon request.

Enco Lathe Turrets are covered in a 16-page catalog issued by the Enco Mfg. Co., 4522-24 Fullerton Ave., Chicago 39, Ill. Pictorial illustrations showing many typical applications of the turrets on actual jobs are included. Among the new models shown is the Enco Carriage Hexturret, now available for lathes from 9 to 32-inch swing. Turret selections for particular lathes are simplified by selection charts listing lathe manufacturers' recommendations, as well as recommendations for lathes no longer manufactured. Copy of Catalog No. 48 free.

LaPlant-Choate Hydraulic Products. The LaPlant-Choate Manufacturing Co., Inc., Cedar Rapids, Iowa, has prepared a 16-page two-color bulletin covering its complete line of hydraulic products, including pumps, motors, valves, power control units, and cylinders. Illustrations of the various products, together with complete descriptions of same, are contained in the bulletin, in addition to installation data. Typical applications of the products are also shown and explained. Copy free upon request.

Weldon Tapered End Mills, claimed to be particularly useful in the manufacture of molds and dies, are illustrated, described, and conveniently listed as to dimensions, number of flutes, and prices in a four-page two-color folder prepared by The Weldon Tool Co., 3000 Woodhill Rd., Cleveland 4, Ohio. Copy free upon request.

Rytense AA, a medium carbon manganese free-cutting machinery steel that is said to offer many economies in the production of machined parts, is described in a four-page two-color illustrated bulletin published by Joseph T. Ryerson & Son., Inc., Box 8000-A, Chicago 80, Ill. The bulletin contains tables listing strength, machinability rating, typical analysis, mechanical properties, and hardness at various tempering temperatures. Copy free upon request.

N.P. Pneumatic "Packaged" Kits which, when applied to light production machinery, convert such machinery to air-powered operation are described in a four-page two-color illustrated folder now being offered by the National Pneumatic Co., Rahway, N. J. Featured items include pneumatic kits for operating metals shears, kick presses, hand milling machines, cut-off machines (circular type), and drill press spindles. Copy of Publication 1066 free upon request.

Standard and Special Arc Welding Studs. A bulletin released by KSM Products, Inc., 6512 Park Ave., Merchantville, N. J., fully describes the arc welding studs and arcshields manufactured by the company for a wide variety of industrial applications. Standard studs, available in sizes from 4-inch-20 x % inch to 3 inches long up to and including 1/2-inch-13 x 1 inch to 31/2 inches long in increments of 1/4 inch in length and is inch in diameter, are described, with design and construction details clearly shown. Also included are information on the chemical analysis and physical properties of the steel used, fluxing method employed, minimum fillet diameters, and thread strength. Special studs without threads, large size studs, collar studs, welding pads, headed studs, and other studs with S.A.E. threads are illustrated and discussed. Copy of Bulletin P-7 is available free to mechanical executives addressing their requests on company letterheads.

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Bond Flexible Insulated Couplings. The Charles Bond Co., 617 Arch St., Philadelphia, Pa., has published an attractive catalog covering numerous types and sizes of flexible insulated couplings. Copy free upon request.

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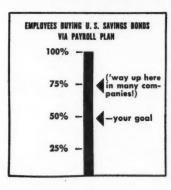
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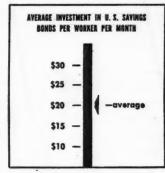
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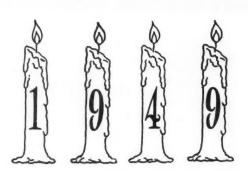
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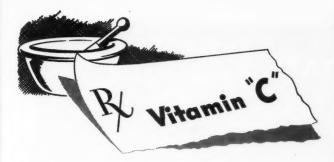


with a sense of deep appreciation for the many fine friendships with which we have been blessed during the past year and for the generous cooperation that has been extended to the organization of Modern Machine Shop, we, the staff members of Modern Machine Shop, extend to you, our readers, our sincere wishes for a Happy and Prosperous New Year.



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### This prescription raised production

Vitamin "C"?-Carboloy Cemented Carbide, of course,

It was a Carboloy engineer who turned the trick. Here's the story: Recently a small plant in Pennsylvania was sadly disappointed on installing a new boring machine, to get no better production from it than they had from the old one. So they called in a Carboloy engineer.

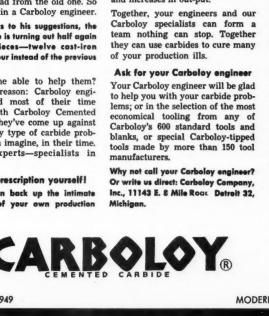
Now? Thanks to his suggestions, the new machine is turning out half again as many pieces—twelve cast-iron wheels an hour instead of the previous

Why was he able to help them? Here's the reason: Carboloy engineers spend most of their time working with Carboloy Cemented Carbides. They've come up against almost every type of carbide problem you can imagine, in their time. They're experts-specialists in carbides.

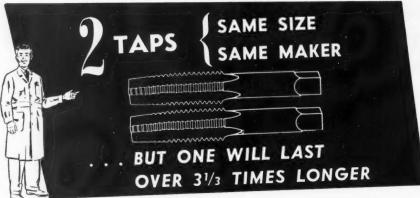
Try this prescription yourself!

You, too, can back up the intimate knowledge of your own production men with this specialized "knowhow" of Carbolov engineers. They can bring to your plant a broad experience in obtaining maximum results with corbides.

Slight changes in tool design, speeds or feeds, grinding, or tool handling often effect far reaching economies and increases in out-put.



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Yes, these taps look alike, but when used there'll be a vast difference in performance. The results of a recent test show why:

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